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# 1999 Annual Report



*Sustainable Agriculture Research and Education*  
SOUTHERN REGION







(Left) Rikki Sterret and Caroll Savage exhibit haymon potatoes at a Northhampton County Farm Field Day. The heirloom haymon sweet potato is enjoying a heyday on Virginia's Eastern Shore thanks to a SARE project that helped limited-resource farmers learn to grow and market specialty crops. (Project LS96-80) Photo by project investigator Terry Thompson.

(Below) Chase Hubbard demonstrates using Milking Devons as a team of oxen. As part of the Hometown Creamery Revival, Chase teaches cheesemaking at the Western North Carolina Nature Center. The Hometown Creamery Revival is making technical assistance and information available to homestead dairies. (Project LS97-83) Photo by project investigator Vicki Dunaway.



Roger Smith (above) who grows organic seed on contract, noticed a correlation between lowered seed production and declining honeybee populations. He is using a Producer Grant to identify alternative pollinators among the insects, birds and bats native to his area of Kentucky. (Project FS99-100) Photo by John Mayne.



(Left) Oconee County High School agriculture students check the nutrient levels in Greenbrier Creek. Farmers, students and other residents of this Georgia community are taking a proactive step to monitor runoff from their farming operations. As time goes by, they will be able to determine management practices that best protect their creeks. (Project LS97-88) Photo by Dorcas Franklin.

## On the front cover

(Top left) A sustainable production and marketing workshop for limited-resource farmers was hosted by Southern University in Baton Rouge during June. Participants toured four family farms, research plots at Southern University and the Baton Rouge Red Stick Farmers Market. They also attended sessions on drip irrigation and grant writing.

(Top right) Theodore Nesmith, a leader in the farming community of Nesmith, South Carolina, is influencing local attitudes about sustainable agriculture. Using his own farm as a model, Nesmith has assembled a team of agricultural support agencies to demonstrate whole farm management. He plans to host two field days toward the end of the project. (FS98-79) Photo by John Mayne.

(Center) Sam Bellamy is experimenting with weeder geese as alternatives to chemical herbicides in his high value blackberry crop in North Carolina. Cover crops, mulches and mowing are also being

evaluated as part of a total pest management program. (Project FS99-85) Photo by John Mayne.

(Bottom right) Small farms specialist Marion Simon (in red cap) started field days at Kentucky State University to train paraprofessionals for one-on-one extension to farmers. But when the public clamored to attend, she applied for and won a Professional Development Grant to finance the expanded sessions. (Project ES97-15)

(Bottom left) Hana Newcomb coordinates work flow among the three farms that make up Potomac Vegetable Farms in Virginia. For nearly 40 years, the family operation has served the Washington DC metropolitan area through a roadside stand, restaurants, farmers markets and a CSA. Hana's mother Hiu Newcomb takes time out from farming to serve on the Southern SARE Administrative Council. Photo by Valerie Berton.



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### What is SARE?

The USDA's Sustainable Agriculture Research and Education Program is a federal competitive grants program with regional leadership. Our mission is to increase knowledge about—and help farmers and ranchers adopt—agricultural practices that are profitable, environmentally sound and beneficial to local communities and society in general.

Since it was first funded in 1988, SARE has awarded more than \$100 million to fund more than 1500 projects nationwide. In 1999 each region administered more than \$11 million. This report shows how Southern SARE invested its share in 1999.

Southern SARE funds four types of projects:

**Research and Education Projects** were the original recipients of SARE funds in 1988. These generally are led by interdisciplinary, multi-institutional, multi-state research teams that include farmers as participants. These projects are administered by the University of Georgia and Fort Valley State University.

**Producer Grants** were started in 1994 to take advantage of producer experience and knowledge. These projects are designed and conducted by producers. Funded for up to \$10,000, they are generally located in one state, often on one farm. These projects are administered jointly by the University of Georgia and Fort Valley State University.

**Professional Development Projects** were implemented in 1994 to train agricultural information providers in sustainable agriculture techniques and concepts. These projects are administered by North Carolina State University, ATTRA and North Carolina A & T University.

**Graduate Student Awards** started in 1999 for full-time graduate students enrolled at accredited colleges and universities in the Southern Region. Up to \$10,000 is awarded to each successful applicant for up to three years of project activities. The funds are paid directly to the university for use on the graduate student's project. These projects are administered jointly by the University of Georgia and Fort Valley State University.

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## The Faces of SARE

Farmers, researchers, educators and others in the Southern Region have contributed to the success that makes the SARE program a model for the country through its innovations in grassroots administration, as well as its outcome-driven research and educational activities. We have featured just a few of these important people on our cover this year. As you meet them through the photos and captions, take note of their faces — faces that show diversity, creativity, perseverance, and a positive approach to solving problems. Those are the faces of Southern SARE.

We are pleased to continue providing the regional annual report as our way of demonstrating accountability as well as the breath and depth of the Southern SARE program. Through this compilation of reports from the research and education, professional development and producer grants, it's easy to see the impact that the Southern SARE is having on southern agriculture and quality of life. As you read the various reports, I encourage you to ask "what good for what people?" In doing so, I think that you will find, as I did, that SARE is having a positive impact on farm families, consumer groups, land owners, environmentalists, students, professional agriculturists and others. These are more faces of SARE.

It is tremendously exciting to think about how far we have come and to envision the vast opportunities as we continue to be inclusive and work together. It's amazing that much of this work has been carried out with limited funding. This speaks to the commitment of those who are involved in these sustainable initiatives. Of course, much still needs to be done in creating a sustainable future for all of us, particularly in the areas of social sustainability as it relates to food security for the poor and the rights of farm workers, because these too are faces of SARE. Hopefully more will be done toward those initiatives in the future.

Enjoy the read and please continue to provide feedback. We love hearing from you.

Sincerely,  
Adell Brown, Ph.D.  
1998 and 1999 Chair  
SARE Administrative Council



## Research and Education Project Summaries

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## **Intercropping Small Grains and Lupin for Sustainable On-Farm Utilization**

### **Objectives**

Agricultural enterprises depend on innovation to stay competitive and as the old saying goes 'necessity is the mother of invention'. Feed costs are the single largest cost item for dairy operations. Due to constant disease and pest pressure it is not economical to produce alfalfa in a large portion of the southern United States.

Alfalfa haylage and hay together with high quality corn silage are the basis of total mixed dairy rations in traditional dairy states such as Wisconsin, Michigan, and New York. We are developing binary mixtures of small grain (wheat, oat) and the large-seeded winter-annual lupin to address the need for a high quality base ration for dairy operations in the southern United States.

### **Results**

This project demonstrated that it is possible to produce 8 - 10 tons of pure lupin per acre silage (65% moisture) compared to 9-13 t/acre for mixed stands and 9-11 t/acre for pure wheat. Harvested at the right time - early bloom, this silage has very high quality.

Relative Feed Value (RFV) is often used as a measure to compare the quality of forage; full bloom alfalfa is assigned a value of 100. The relative feed value of the lupin leaf component is > 230 and lupin stem are approximately 130. The resulting total silage has a RFV exceeding 135 which is in the range found for corn silage made from corn with well developed ears.

Growing a small grain with the lupin rather than lupin in monoculture produces some desirable effects, among them enhanced survival of lupin seedling. Our research also showed that careful seedbed preparation is a must for successful lupin cultivation. Fall-seeded lupin is a very attractive deer browse in wildlife plots. Deer tended to consume lupin preferentially over all other forages offered to them. In 1997, we had the first commercial lupin acreage in Alabama for seed production.

*(Editor's note: An eight-page article from this project appeared in the Journal of Production Agriculture. Request a copy from Gwen Roland at (770) 412-4786.)*

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**SARE grant     \$143,151**





## Soil Conservation and Pest Management Impacts of Grass Hedges

### Objectives

- 1) Evaluate erosion-control effectiveness of grass hedge field plantings.
- 2) Increase understanding of response of arthropods to hedges in cotton production systems.
- 3) Increase information delivery of grass hedge technology to limited-resource farmers.
- 4) Evaluate farmer responses to farming with grass hedges and share experiences with others.
- 5) Incorporate new knowledge into an improved USDA-NRCS standard and specification.
- 6) Develop a computer program to predict the long-term impact of benching between hedges on runoff, soil erosion, and productivity.

### Approach

Erosion control effectiveness was evaluated by observing and surveying fields where hedges had been in place for up to 9 years. The amount of soil moved by tillage between hedges was quantified experimentally.

Significant bench terrace formation was observed due to soil translocation from erosion and tillage processes. Current erosion prediction models, including WEPP and RUSLE, do not account for slope variation over time. We developed a computer model that does this and found reductions in erosion by 75% as a result of slope modification predicted from farming between hedges for 12 years.

Insects were monitored with pheromone traps and sweep nets in grass hedges and in crops adjacent to hedges. Winter temperature regime in hedges and nearby habitats was also monitored to determine their value as overwintering habitat for insects. Sampling included extensive trapping for boll weevil (*Anthonomus grandis*) and various species of ants and sampling for tarnished plant bug (*Lygus lineolaris*) and beneficial natural enemies. Very few insects were associated with hedges that were free of broad leaf weeds. Numbers of plant bugs increased significantly with appearance of preferred host plants of plant bug such as pigweed, mare's tail, daisy fleabane or curly doc. In these cases there were minor infestations of tarnished plant bug in hedge weeds. Significantly higher numbers of ants (beneficial predators) were associated with the

hedges and in rows closest to the hedges than in areas of the field not influenced by hedges. Pheromone trap catches indicated that the hedges provide better overwintering habitat for boll weevils compared to mowed grass/mixed forb strips located along roadways, but habitat was not as favorable for overwintering as deciduous field boarders.

Soybean growth, soil water content, and crop yield were measured in transects oriented perpendicular to grass hedges of unclipped 'Alamo' switchgrass, clipped Alamo, or two shorter switchgrass accessions.

Unclipped Alamo grew to 8 ft in height, had a canopy spread of 12.5 ft, and reduced soybean yield in the first adjacent row. Clipped Alamo and the shorter accessions did not reduce soybean yield. Soil water contents were higher under the row adjacent to unclipped Alamo, indicating that yield reduction was due to shading.

Farmers, conservationists, and project scientists interviewed at the initiation of this project generally agreed that grass hedges would be an effective deterrent to erosion. However, there was concern about the possible side effects such as harboring harmful insects or the introduction of unwanted weed seeds. Return interviews to determine alterations in attitudes based on experiences in the project are planned for year 2000.

Grass hedges, called Vegetative Barriers by the USDA-NRCS, was selected to be one of ten types of conservation buffers included by NRCS in their CORE4 training program. Training materials were published on CD-ROM; the second edition of 5,500 copies is currently in press. In 1999 NRCS formed a committee, which included Seth Dabney, to draft a new national practice standard for Vegetative Barriers. Draft results of that committee's work have been posted for comment on an internal NRCS web site. Proceedings of a recent grass hedge workshop held in Beltsville, MD, are available at:

<http://rhizo.ars.usda.gov/grasshedges/>

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## Improving Integrated Resource Management Skills of Beef Producers

### Objectives

Producers who apply appropriate integrated resource management (IRM) techniques and tools are better equipped to survive in a globally competitive environment. This project will:

1.) Identify technological tools supporting IRM by reviewing and developing software.

2.) Develop case studies to document producer's selection and application of IRM practices and decision-support tools.

3.) Identify IRM research and education needs through forums in which producers (or agricultural advisors) share information and ideas and suggest areas for additional research.

#### *Objective 1*

Farm operators are being made aware of record-keeping tools for assessing effectiveness and sustainability of management practices. Cow-calf Standardized Performance Analysis (SPA) and Quicken® software are among the tools used and demonstrated with producers and agricultural professionals. Instructions for using Quicken for farm financial record keeping are being updated annually for new releases of the software. New software to focus on the affordability of part-time ranching has been developed as has a prototype model to identify profit-maximizing forage/livestock systems in Oklahoma. Educational programs include intensive "hands on" workshops, demonstrations, publications, and materials on the WWW. Gaps in tools available to support decision-making are continuing to be identified. Software that facilitates IRM analysis and decision making is being evaluated, developed and updated. A thesis, "A Least-Cost Evaluation of Alternative Winter Feeding Options for Cow-Calf Operations in Northern Alabama" demonstrates applications in that state. Educational materials are being modified to reflect lessons learned through field experience and case studies.

#### *Objective 2*

Case studies are summarized in a thesis, "Evaluation of Integrated Resource Management Skills of Beef Cattle Producers Using the Case Study Method." The case studies confirmed that producers, due to differences in soil resources, managerial expertise, or capital constraints, have different limiting factors. Interdisciplinary teams visited farms, helped

participants assemble financial and production data, and discussed potential changes in practices. Details about management structure, goals, enterprise mix, information system components, personal characteristics of farm managers, inventory of farm resources and production levels, and the manager's perception of farm risks were noted. Case study data were examined to identify production and information practices which could benefit other farms. The interview packet has been adapted for use in several other projects.

#### *Objective 3*

Information exchanges are being conducted periodically. The forums allow participants to share ideas and experiences concerning various aspects of integrated resource management. Producer information exchanges focus on a limited number of topics—for example, marketing alternatives, grazing management, herd health practices—identified in advance. The emphasis is on participants learning from each other and researchers learning from participants. Thus, the forums suggest research and education needs and serve as a basis for future dialogue. Similar formats have been used for exchanges among veterinarians and accountants. Both producers and educators voiced a need for a publication to provide prospective beef producers with realistic expectations of resource and management needs. A draft of "So, You Want to Be a Rancher?" has been completed and will be finished in the coming year.

Investigators are capitalizing on ongoing, related efforts through cooperatively planned activities to benefit all beef producers, small and large, with integrated, interdisciplinary programs and materials. In addition, agricultural advisors such as accountants and veterinarians are being offered training to familiarize them with managerial concepts outside their traditional areas so that they can better assist producers. This project promotes the development of management skills and improved resource management practices, thus building human capital. Expected outcomes of the project include greater adoption of technological tools, improved on-farm information systems, and greater understanding of IRM concepts with increased feedback to researchers on high priority needs.

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**SARE grant**  
**\$163,642**



## Crop Management Systems for Improving Production of Culinary Herbs in the Virgin Islands

### Objectives

1) Develop sustainable soil management practices for culinary herb production using crop rotation with green manures, application of composts, animal manures and other organic fertilizers.

2) Evaluate sustainable weed management methods for culinary herbs using organic mulches, cover crops and biodegradable synthetic mulches.

3) Develop environmentally sound disease and pest management practices for herbs through cultural methods such as intercropping and crop rotation.

4) Increase fertilizer and water use efficiency in herb production by using microirrigation, thereby reducing fertilizer inputs and conserving water, a scarce resource in the Virgin Islands.

### Approach

On-station trials were conducted in 1999 to evaluate the benefit of organic mulches on culinary herb production. Organic mulches included grass straw, wood chips and shredded paper. These mulches were compared against white plastic mulch and the control (bare) for their effect on yield of chive and thyme. Plots consisted of three rows 3.6 m long and spaced 0.41 m between rows. Plots were fertilized with cow manure (2.0% N, 1%P and 2%K) at the rate of 9.0 kg per plot. All plots were drip irrigated to maintain soil moisture tension at 30 kPa. Mulch effects on weed population and water use were also determined. The economic returns due to various mulches were compared using preliminary yield data from chives.

### Results

Partial results from chive trial at the experiment station showed fresh yield in the order of straw>paper>plastic>wood chip>control (bare). At the VI Department of Agriculture fresh yield was in the order of plastic>straw>wood chip>paper>control (bare). These results indicate that organic mulches provide similar or better yield advantage than synthetic (plastic) mulch. All mulches resulted in greater yield than the control (no mulch). All mulch treatments also resulted in reduced weed population compared to the control (bare plots). Due to high rainfall during the season, differences in irrigation water use among mulch treatments

and the control were not significant.

Using the yield data from the experiment station trial, economic comparison of alternative mulch treatments indicated that net return above mulch costs was highest with straw mulch. This indicates that grass straw mulch would provide herb growers better economic benefit than other mulches. Grass straw is locally available and biodegradable and when fully decomposed will contribute organic matter to the soil. Another benefit of using organic mulches is that they provide soil cover reducing soil erosion during heavy rainfall. It was observed that plots without mulch had greater surface erosion than mulched plots after a heavy rainfall. Therefore, mulches do not only improve yield and economic return but also conserve and protect soil resources and the environment.

Over the period of three years, the project has fully accomplished Objectives 1 and 2. Objectives 3 and 4 have been partially achieved and some of the field trials are currently conducted under a one year no-cost extension ending on May 2000. These trials involved biological control of leaf miner and cutworms on basil and chive, soil solarization for fungal disease control on thyme, monitoring of insect pests in green manure rotation with culinary herbs and microirrigation trial to measure water requirement of herbs for efficient fertilizer and water use.

Based on the results from the studies conducted so far, the use of green manures in rotation with herbs demonstrates their potential for improving soil fertility and yield of culinary herbs. Organic mulches such as grass straw offers a good alternative to synthetic mulches. The project should demonstrate the benefits of using sustainable crop management practices for herb production such as utilization of local resources for maintaining soil fertility, reduce weed and pest problems and efficient use of water and fertilizer.

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**SARE grant**  
**\$143,529**





## Integration of Pastured Poultry Production into the Farming Systems of Limited Resource Farmers

Limited resource farmers in the USA need profitable farm enterprise alternatives to survive on the farm. In this project, Heifer Project International (HPI) and numerous collaborators gave limited resource farmers the opportunity to test a relatively new farm enterprise that is both economically and environmentally sound. That enterprise is pastured poultry. Pastured poultry is an endeavor in which broiler chickens (in this case) are raised on pasture in pens that are moved across the pasture daily. The chickens receive sunlight, fresh grass and fresh air everyday and are usually processed on the farm. No antibiotics are required in the feed. The system is healthy for the livestock, builds the soil with manure from the chickens, and provides the farmer with a decent return from this value added product.

### Objectives

1.) Provide hands-on training in pastured poultry production to twenty-four farm families who are currently members of farmer organizations supported by Heifer Project International.

We exceeded this objective; 213 families were trained.

2.) Review and summarize federal and state laws regarding on-farm processing of poultry. This was done for the 13 southern states, Puerto Rico and the U.S. Virgin Islands.

3.) Provide training in food safety and legal issues for the same twenty-four families and to assist them in complying with the laws in their state. This was done for all 213 families.

4.) Provide training in market development of farm products for the same farmers. This was done for all 213 families.

5.) Help these 24 families conduct on-farm practical trials of pastured poultry and its integration with their other farm enterprises. This was done for 54 of the 213 families who participated in the comprehensive training sessions.

6.) Include at least eight technical advisors (county extension agents or advisors from other local organizations) in the training program so they are prepared to support and encourage these families and others in the community. We exceeded this objective. We provided training to 39 technical advisors.

7.) Develop and implement monitoring systems that will provide useful information

(income generation, pasture management, farm labor management, quality of life implications, farmer observations and problems) about integrating pastured poultry into a farming system. This was done. The results will be published by NCAT/ATTRA in case-study booklet form in December 1999.

8.) Provide follow-up guidance and assistance to the families as they diversify their own production and marketing. This was done throughout the life of the project, and it will be continued through HPI's normal supportive work with local farmer groups.

9.) Aid in the development of the American Pastured Poultry Producers Association (APPPA), which will serve these farmers and others around the country by providing a forum to share information and ideas related to pastured poultry. In 1997 we established and incorporated APPPA as a non-profit, 501(c)(6), trade association. It now has almost 500 members in 45 US states, Antigua, Australia, and Canada.

### Approach

A key component of this project was comprehensive training for farm families and extensionists in all aspects of the pastured poultry enterprise: production, processing and marketing. We conducted eight major training workshops: three in Kentucky; two in Virginia (at the Salatin Family's Polyface Farm); and one each in Alabama, Florida and Georgia. Two hundred and thirteen farm families and 39 technical advisors participated in these events. Participants built chicken pens, moved the pens, learned about brooding the chicks, butchered chickens, received instruction in food safety and legal issues, learned marketing techniques, and learned how to complete the required record books.

After completing training, the farmers who chose to continue in this program were given funds to do a small scale version of pastured poultry on their own farms. With the funds each farmer built a pen, and purchased 100 chicks, a feeder and a waterer. Upon receiving their checks, each farmer also signed a contract to "pass on the gift." Passing on the gift is a Heifer Project tradition in which everyone who receives a gift of animals becomes a donor. In this case each farmer who received funds to start the poultry project was required to return to

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Heifer Project the purchase price of the chicks and to train another farmer in their area in the pastured poultry enterprise.

In signing the contract, the farmers also agreed to monitor their activities in record books provided to them. The record books included an expense and income log, a folder for receipts, a log to record total pounds of feed used, a daily calendar to record particular activities or occurrences, an information page on pasture management, a detailed labor summary, questions about the family's values and how this project impacted the quality of life for themselves and their community, and a page on farmer observations and problems.

Fifty-four families chose to fully participate in and take advantage of this whole program. This significantly exceeded our original goal of 24 families.

The National Center for Agricultural Law Research and Information (NCALRI) prepared a legal review of federal and state laws concerning on-farm processing and marketing of poultry in all 13 states and the two territories in the Southern Region. This review will be expanded to include all 50 states as part of the second SARE-funded project we began in 1999: "Enhancing Feasibility for Range Poultry Expansion."

As original collaborators, Kentucky State University and Southern University demonstrated Pastured Poultry throughout the term of this project, and provided numerous opportunities for farmers and extensionists to learn more about this enterprise.

Fort Valley State University in Georgia and Florida A&M University joined this initiative in 1997 and actively demonstrated Pastured Poultry during 1998. Both of these institutions hosted Pastured Poultry training workshops in January 1999.

The results to date have been very encouraging. Through the four growing seasons completed (1996-1999), 213 limited-resource farmers have received training and 54 of them tested pastured poultry on their own farms with assistance from this SARE grant. Most have been very pleased with the results of their work and several have expanded their operations or plan to in the future. In most cases, farmers are finding a good market for the chickens and see pastured poultry as a viable component of their farms.

In addition to the farmers who actually received SARE funds to try the enterprise, many other farmers have received just the training portion of the program and some have gone on to start enterprises on their own. In addition to the formal training sessions provided by this project, the participants and collaborators have made numerous presentations at agricultural conferences, workshops and field days throughout the South and around the country. Pastured Poultry is now on the agenda of nearly every educational event focused on sustainable agriculture.

Our outreach to farm families in other parts of the country also continues to grow. The American Pastured Poultry Producers Association (APPPA) was organized in January 1997 under the guidance of a Steering Committee of nine producers, and it was incorporated later that year. Since then, APPPA has published 10 issues of its quarterly newsletter, "APPPA Grit!", and grown to almost 500 dues-paying members.

Likewise, the demand for ATTRA's services related to Pastured Poultry has surged. In 1996-99, requests for their general publication on Sustainable Chicken Production averaged four times higher than in 1995. They also received more than three times as many specific questions about poultry in these years, compared to the number received in 1995.

Pastured poultry is a sustainable livestock production system that complements other farm enterprises very well. It is good for the people, the land and the livestock. It encourages local food economies and puts more of the food dollar into the hands of farmers. It builds bridges between producers and consumers. It has the potential to keep many more family farmers on their farms.





## **Sustainable Cropping Systems for Seedless Watermelon and Fall Lettuce in Rotation with Green Manures**

### **Objectives**

The goal of the project was to develop a sustainable crop rotation system for the production of seedless watermelon and fall lettuce following selected cover crops.

### **Results**

The cover crop treatments originally were Austrian Winter Pea, Hairy Vetch, Austrian Winter Pea and rye, and Hairy Vetch and Rye, and a non-planted control. From fall of 97 Crimson Clover replaced Austrian Winter Peas. Cover crops were planted from 96-98 at seven locations in North Carolina and Virginia at experiment stations and farmer's fields.

The cover crop growth and biomass production were not significantly different under the treatments. The biomass production ranged from 3.2 to 4.8 tons per acre. In the spring of 1997-99, the cover crops were mowed down with a flail mower and left as a surface mulch to control weeds and soil erosion, and retain soil moisture.

Two seedless watermelon varieties were transplanted and grown in each cover crop treatment at all of the sites. The watermelon crop was established well in North Carolina sites, and Virginia sites. Seedless watermelon yields were satisfactory in Guilford, Lenoir and Rockingham counties of North Carolina. In Guilford County, watermelon yields were the highest under Hairy Vetch Treatment (14.7 ton/acre). In Rockingham County, the treatment of Austrian Winter Pea and Rye mixture yielded 29.0 ton/acre and it was the highest among all the sites. Average yield of these three sites was 17.3 ton/acre with a standard deviation of 6 ton/acre. Average number of melons in Guilford, Lenoir and Rockingham counties was 2600 per acre, average weight was 17.3 tons/acre.

A quality analysis of seedless watermelon from North Carolina sites conducted by Virginia State University revealed that the average sugar content in the watermelons from sites of Guilford and Rockingham counties was 8.17% with a standard deviation of 0.33%.

Seedless watermelon yields in Virginia ranged from 4.9 to 34.7 tons/acre. Quality analysis of Virginia melons showed meat: rind

ratio 1.2 to 1.8 and it was not affected by cover crops. Also, sugar and other quality parameters were not effected by the cover crops.

Cooperating farmers of North Carolina sold all of their seedless watermelons in the local farmer's markets. At Fletcher Crimson Clover and Rye treatment produced the highest yields (6.6 tons/acre). There was no size difference between the seedless watermelon tested. A survey was conducted by including professionals, farmers, marketeers, household individuals and others to evaluate seedless watermelons from this research and demonstration. Eighty percent of the survey participants favored the taste of seedless watermelon. Ninety-two percent of them showed their preference to buy seedless watermelons even at a higher price than seeded melons.

At the site of Guilford County, North Carolina, we monitored the nitrate leaching in watermelon plots due to cover crop mulch decomposition. The nitrate results showed that decomposition of the cover crop mulch provided enough nitrogen nutrient for the growth and development of seedless watermelon. However, there is a potential risk of nitrate leaching to deep soil or groundwater after the maturity of most of the watermelons.

Pest populations were also monitored and there were no real problems with pests and diseases. However, as the cover crop mulch decomposition progressed, weeds became a problem at the middle and late stages of the watermelon growth.

After the harvest of the watermelon there was not enough time for fall lettuce crop due to the timely planting of cover crops. Therefore, all the plots were tilled and planted with respective treatments of cover crops. Due to poor performance observed at some sites under the treatments of Austrian Winter Pea and the mixture of Austrian Winter Pea and rye, we replaced Austrian Winter Pea with Crimson Clover from the fall of 1997-99.

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**SARE grant**  
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## **Saving the Southern Legacy: Heirloom Plants and Local Knowledge for Profitable, Sustainable Agriculture**

### **Objectives**

The Southern Seed Legacy originated in response to the notable absence of the American South in the nation-wide grassroots effort to save heirloom or landrace seeds. In 1996, the project received three years of funding from SARE for the following purposes:

1. Identify individuals, and communities involved in saving heirloom seeds in the South;
2. Map the "at risk" plant varieties that are culturally and historically relevant to ethnic groups within the agroecoregions;
3. Document knowledge associated with heirloom varieties;
4. Conduct marketing studies on heirlooms and products;
5. Facilitate exchange of germplasm and associated knowledge.

### **Results**

The funded project ended in August, 1999, with all of the above objectives accomplished. Today, the Southern Seed Legacy is a self-sufficient organization supported by over 150 paying participants, and is no longer dependent on government funding.

During the research phase, the project uncovered active and viable seed saving networks (both of individuals and organizations) throughout most areas of the South. This was especially true of southern varieties of vegetable, fruit, ornamental, and other useful domesticated plants.

The SSL seed bank holds approximately 300 seed sample accessions of nearly as many different named varieties collected in our field research or donated by SSL members. These varieties are important as heirlooms in some families and ethnic traditions, but they were becoming less and less available. SSL has expanded our efforts to both document and bolster support for seed saving and continued cultivation of these "old timey" crops in their home regions. Moreover, we are discovering through our memory banking research that many of these heirloom seeds and plants serve as artifacts of larger cultural expressions (cuisine, folklore, community values, social customs), that they serve as connections to ancestry, identity, and what it means to be Southern in a globalizing world.

Unfortunately, the expertise and knowledge which these old varieties represent, while still extant, is seriously threatened, often vanishing at a more rapid pace than the plant varieties it evolved to sustain. This project is based on the conviction that the expertise, values, and favored varieties of an earlier farming generation can play an integral role in building sustainable and profitable agriculture in the South. This is why SSL is not solely devoted to collecting seeds of old timey varieties, but is memory banking the knowledge, stories, and other information associated with these plants and their products. The aim of this project has been to collect, record, and disseminate this legacy of knowledge providing a resource for all Southerners to draw on for business or pleasure. We believe these long time favorites offer potential low cost, low maintenance, and high value, high interest crop options for Southern region producers working toward the goals of sustainable agriculture.

The outreach and education component of this project has involved building a Southern region-wide SSL Network, outreach visits, presentations, exhibits, display gardens, teaching kits, and SSLP-sponsored workshops/conferences. The SSL Network, a communication and information network, consists of over 500 individual and institutional seedsavers and seedseekers of different states, and is encouraging and supporting heirloom variety cultivation, seedsaving and exchange among growers. Our Resource Directory of network contacts and members illustrates this broad participation.

With origins as a voluntary network since 1993, and then three years of SARE funding since 1996, SSL has grown and expanded its breadth and impact. Accomplishments in 1999 include the publication and distribution of 200 Resource Directories and 50 "Yesterday's Way's, Tomorrow's Treasures: Heirloom Plants and Memory Banking" Teaching Packet and Tool Kits to educators. The Resource Directory will be revised annually (a 2000 edition is in the works now) and will facilitate networking between

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individuals and organizations offering and seeking heirloom seed throughout the Southern Region.

Also in the Resource Directory are state-by-state listings of farmer's markets, living history farms & museums, botanical gardens, seed saving & alternative agriculture organizations, regional seed companies, agricultural newspapers, kindred web sites, and a bibliography of suggested readings. Further outputs of SSL researchers include a report on marketing of heirlooms and their products, two masters thesis (one in horticulture and one in ecology), and one dissertation in anthropology. Abbreviated reports of the findings of these studies will be found in future SSL publications made widely available.

This year also saw the further development of PASS: Pass Along Southern Seeds, an initiative designed to promote conservation through use. We have added information about our PASS initiative and listings of the seed available to our Southern Memories web site (<http://www.uga.edu/~sm>). Since February 1999, this has generated over 25 requests for seed that participants will agree to grow out, record performance information about, and then return one third of the seed to SSL, keep one third for themselves, passing along the final third.

SSL is now successfully moving into another phase as a non-profit, member-supported organization institutionalized separately from the University of Georgia. Since announcing at the end of August, over 150 members have contributed \$10 or higher membership donations to support our mission. Members receive our publications, including the Resource Directory and newsletter, Seedlink, and free participation in all SSL-sponsored events, such as the Annual Seed Swap. Our Third Annual Seed Swap in May 1999, marked the first occasion the Southern Seed Legacy Award was given. Long time seed saver and memory banking participant Ernest Keheley of Marietta, Georgia, received a plaque commemorating his years of seed saving.

SSL's impact is gauged in part by the responses we've had to our initiatives and efforts from farmers, gardeners, and consumers over our three years of research, outreach and education activities in the South. Our project has been written up in many newspaper and magazine articles. An article in the Atlanta Journal-Constitution profiling SSL that appeared Sunday, August 29, 1999, edition, "For these gleaners of seeds, older is better"

generated an immediate overwhelming response via e-mail (96 messages to date) and written mail, even from outside the region as the article appeared in subsidiary papers as well. Respondents have ranged from educators, writers, hobby gardeners, activists, agricultural historians, to farmers. Through our marketing study we have found that people are demanding more and more quality ant that the old varieties carry a value added when marketed in the right places.

We believe our message is reaching a larger audience as well. We were commended to the US Secretary of agriculture by the national Genetic Resources Council for our efforts in maintaining agrobiodiversity on American Farms. The Washington Area Practicing Anthropologists association recognized SSL codirector Virginia Nazarea and her memory banking work with their prestigious PRAXIS award in November 1999.

The Southern Seed Legacy is just over three years old. At this point, we have established a regional network of enthusiastic partners. Hundreds of local farmers and gardeners have participated by either being interviewed, reading and responding to our newsletter, or by mailing us their own saved seeds. There is a great deal of research we would like to pursue, and in future we will likely submit additional grants. In the meantime, SSL will continue its outreach efforts with the help of our supporters.



## Alternative Agriculture Strategies for Rural Community Sustainable Development in Northhampton County, Virginia

### Objectives

1) Establish communication network which explores and shares the benefits from and perceived barriers to adopting sustainable agriculture with growers on the Shore, reaching beyond the agricultural community to include other sustainable development and marketing efforts.

2) Identify and evaluate agricultural and economic opportunities including adaptation of sustainable techniques, identification of constraints, development of risk analysis, and evaluation of market strength and potential.

3) Facilitate implementation of on-farm demonstration sites exploring diversification.

4) Conduct research, analysis and feasibility studies to assist farmers in transition to alternative crops and/or technology and the production and marketing of value-added products.

5) Evaluate the success of this project by monitoring the farmers' and the local citizens' perceptions of sustainable agriculture's role in this rural community's vision.

### Work Accomplished

Agriculture and seafood have historically been the predominant sources of income for the environmentally sensitive Eastern Shore of Virginia. Located between the Atlantic Ocean and the Chesapeake Bay on the lower Delmarva Peninsula, the impact of land use decisions go beyond the farming community and affect the entire ecosystem and all local residents. Community sustainable development initiatives on the Eastern Shore promote economic vitality while protecting the environment and rural quality of life. This includes sustaining productive locally owned farms for the benefit of the community and future generations.

There is a vital need for crop diversification and value-added marketing to strengthen agricultural competitiveness and secure employment opportunities. An integrated, systems approach to explore this potential was developed at the request of growers. This approach examined production management, economic potential, marketing feasibility, new entrepreneurial opportunities, and environmental impact of both traditional crops and proposed alternatives. Both large-scale, agronomic crop alternatives, as well

as small-scale high value crops are needed to promote environmentally sound, economically feasible crop diversification on the Eastern Shore of Virginia.

This project used grower managed on-farm demonstration plots coordinated with site-specific sustainable production research, concurrent economic risk analysis, value-added market feasibility determination, ecological impact reduction, and rural community development to strengthen the role of the family farm. The participating growers were supported by an interdisciplinary technical team with expertise in extension service, sustainable agricultural production, niche crop experience, economic feasibility assessment, market development, sustainable community development, conservation, and socio-economic and ecological impact monitoring. The technical team provided support information, on-farm consultation of management skills for incorporating appropriate sustainable practices into each demonstration plot, and farm business planning and value-added marketing assistance.

An active effort was able to involve a broad range of diverse growers, including: from full-time to part-time farmers, from growers who own a family farm to those that lease land for production, from growers working at agronomic scale down to horticultural niche crop and market garden scale, from growers who employ farm workers to those who are themselves farm workers, from limited resource and minority growers to successful agribusiness people.

This project developed a diversity of grower-managed demonstration plots using alternative technology or producing alternative crops, within the context of the grower's whole farm strategy and business plan. Despite the extreme drought conditions in 1997 and 1999 and hayman potato crop disaster in 1998, several of the demonstration plots provided important production information and enough crops for initial test marketing. This project has assisted growers in exploring economically and environmentally sound management strategies and improved marketing

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opportunities for several crops, including: hayman sweet potatoes, seedless watermelons, everlasting flowers, cut flowers, organic production, and deciduous holly buffer.

Complementary agriculture research station plots have developed important support information for the expansion of hayman production by additional growers. Economic computer model determined kenaf production was not currently feasible and identified conditions necessary to become economically viable for crop diversification. Coordinated computer modelling and research station plot production results identified fall broccoli and lettuce as potentially viable options. A interactive Excel file format computer model was adapted so growers and extension agents throughout Virginia will be able to use the interactive program to assess market windows and directly examine the impact of production and marketing changes to manage economic risk, extending the contribution beyond the Eastern Shore. Economic business analyses have provided information to support an entrepreneurial approach to niche and organic crop production with value-added marketing strategies as part of community-based sustainable development initiatives on the Eastern Shore of Virginia.

#### **Benefits to farmers and consumers**

The strength of this project's impacts and contribution lies in the diversity of participating growers, the interdisciplinary team work of the technical team, and the connections to the local community. The project explored ways to protect productive family farms by involving diversification of crops, efficient production practices and value-added marketing strategies to give sustainable agriculture the necessary economic advantage and connection to the local community and environment.

The results and various "products" from this project have provided information, tools and methods growers can use to evaluate potential new enterprises which involve crop diversification and a transition to alternative agriculture strategies on the Eastern Shore. This project has made a good start by identifying production, socio-economic, and environmental barriers to sustainable agriculture and by establishing a network of local growers and resource professionals to share ideas and information. This project has also helped establish networking with value-added marketing and broader sustainable community development initiatives.

The value-added, branded marketing of Eastern Shore Select™ Hayman potatoes and chips emphasizing the Eastern Shore's unique rural culture and environment offers hope for an economically and ecologically viable option for the survival of the historically family-owned Eastern Shore farms. Crop specific

"Best Management Practices" ensure environmental compatibility and consumer product quality as a pre-requisite to qualify for this marketing advantage. Other agricultural and aquacultural products also have a potential for this kind of marketing in the future. The publicity associated with the value-added Eastern Shore Select™ Hayman marketing campaign has also accomplished valuable outreach locally, regionally, and nationally related to the goals of this SARE project.

The Community Garden project demonstrates how sustainable agriculture can be incorporated into rural community development. The garden was started by this low-income community as a pilot project to produce mixed vegetables for distribution first to the community's elderly and handicapped residents and then shared by the rest of the residents. The community garden has successfully fed about 30 people each year. The groundwork laid with the SARE grant Community Garden project is now in transition to a Community Farm project that can generate cash and income for the community and its residents, with the potential to include 130 acres for agricultural production and marketing through a community subscription program.

Lessons learned from this SARE project have been and will continue to be shared as a model for other rural communities, demonstrating a method where the transition to sustainable agriculture supports the preservation of the community's rural life style and environment. Sustainable agriculture in general, and SARE projects more specifically, are presented to national and international visitors as a critical part of a landscape-level approach to community-based conservation.

The Green's Creek watershed approach created an exciting landscape-level illustration of sustainable agriculture in action for farmland protection:

- environmental research in the agro-ecosystem
- best management buffer with potential for economic return
- hayman potato production linked to value-added marketing
- organic crop and livestock production
- and dried flower enterprise with niche marketing

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All Farmers



## Sustainable Crop and Livestock Systems in the Texas High Plains

### Objectives

1. Compare productivity, profitability, and impact on natural resources of continuous cotton systems, all forage-livestock systems, and an integrated cotton-forage/livestock system.

2. Involve local producers and industry in identifying researchable needs, in developing and testing systems of production, in the development of more effective dissemination of information to end users, and enhanced adoption of new technologies.

3. Link this research with sustainable systems research in other ecoregions to increase the base of knowledge and understanding of the principles that apply to integrated systems.

### Approach

Texas High Plains crop production has used precipitation and supplemental irrigation with water pumped from the Ogallala aquifer at rates that have far exceeded recharge for many years. Over 20% of the U.S. cotton (*Gossypium hirsutum*) crop is produced in this once vast grassland. Most of this cotton is produced in monoculture systems that are economically risky and contribute to wind induced erosion and depletion of ground water resources. Although large numbers of cattle are found in this region, little integration of livestock and crop production exists. Integrated crop-livestock systems could improve nutrient cycling, reduce soil erosion, improve water management, interrupt pest cycles, and reduce economic risk through diversification. Thus, two systems are compared: 1) a Conventional Irrigated Cotton System; and 2) an Alternative Integrated Crop-Livestock System for production of both cotton and stocker steers. The Alternative System integrates cotton in rotation with forages for grazing by steers. Producer cooperators provide on-farm testing, help to identify researchable needs, and outlets for information to producers and industry.

In year 2, Angus and Angus X Hereford steers (initial body weight 495 lb) grazed pastures from January to July and then were moved to the feedlot for finishing. Steers spent 181 days on pasture and 125 days on the feedlot (final weight 1304 lb). Daily gains during the pasture and feedlot phases were 2.08 and 3.42 lb/day, respectively. In October, 1999, bluestem seed were harvested and the forage was stockpiled for winter grazing.

Roundup-Ready Cotton was no-till drilled into the rye stubble on level ground for the Alternative

System and was planted into beds between the terminated wheat for the Conventional System. Cotton has been harvested and yields are being measured.

Weed species and numbers measured for the two cotton systems were quite different from those measured during the previous year. Measurements will continue to monitor shifts in weed populations. In autumn of 1998, boll weevils were placed in emergence cages in two types of potential habitats; i.e. old world bluestem and in terminated rye/cotton. Results indicated that weevils are capable of surviving a mild winter in either habitat. The difference between the two habitats was not considered significant and the percentage survival was considered to be very low (2.67 and 2.83%, respectively). Soil-borne disease potential was close to zero at the beginning of this research. In autumn of 1999, there were similar numbers of nematodes in the soil between the two systems and among the cropping components in the alternative system. There were no soil-borne fungal diseases at measurable levels at the initiation of the project and in general disease potential remains low. However, the seedling disease potential does appear to be climbing, particularly in the continuous cotton.

Water use by both systems was lower during year 2 than year 1. The Continuous Cotton System required 15 acre inches of water/system while the Alternative System required 11 acres inches of water. Economic analysis for year 2 will be completed once all crops have been harvested. The Alternative System appears more flexible with multiple harvests of saleable products while the Conventional Cotton System is highly dependant on the success of the monoculture crop.

A field day, attended by over 125 people, was held in October 1999 to disseminate information to producers, industry, the media, and policy makers. This project will benefit producers and the public in general by providing opportunity to reduce water use while maintaining or enhancing profitability and flexibility of agricultural systems. However, additional years of testing are necessary to determine longer term effects.

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## The Hometown Creamery Revival

The Hometown Creamery Revival (HCR) was conceived of to support the revitalization of small-scale dairies and rural economies in the South through creation of unique, ecologically produced dairy products to be offered in local and regional outlets. The Southeast region of the United States continues to be the area losing the most dairies – 5.9% fewer herds in 1999, according to *Hoard's Dairyman* (October 25, 1999).

### Objectives

The objectives of the Hometown Creamery Revival project are to: (1) conduct necessary processing and market research; (2) encourage cooperation and information exchange between formerly isolated dairy farmers and provide educational resources and opportunities for participating farmers; (3) emphasize soil and water quality improvement, humane animal treatment and food safety as essential elements of sustainable dairying; (4) design and oversee construction of low-cost facilities; (5) begin production, develop shared marketing tactics and begin trial marketing within the local region; (6) involve end-users by eliciting direct feedback from them; (7) document and disseminate all of the above.

To date we have integrated elements of all of these objectives into our activities. It is particularly pleasing to see the increasing interaction between dairy farmers through attendance at pasture walks, workshops and conferences, as well as through e-mail discussion groups and print media. Hundreds of farmers and homestead cheesemakers have contacted the HCR office and individual participants in the past year, and many have become involved in regional activities for the first time as a result of the information they received. We've also found that the market for many farmstead dairy products is ample, and are encouraged by consumer trends toward fresher and more unique foods.

In 1999 we have extended our outreach in many ways – providing a continually updated Web site, offering cheesemaking classes, becoming active in e-mail discussion groups, lending materials from our library, and initiating a quarterly newsletter for small-scale dairies. We have also formed liaisons with other organizations, including the Western North Carolina

Nature Center, the Carolina Farm Stewardship Association, the American Livestock Breeds Conservancy, Southern Sustainable Agriculture Working Group (SSAWG), the American Cheese Society, the Jacksonville Center (a local tourist center), New River Community Partners (a regional rural development group) and Slow Food (an international consumer group). As noted above, we have provided assistance and information to a number of individuals and groups interested in starting their own small dairy businesses. Officials at the state dairy branch office tell us that they have received an increasing number of inquiries about the requirements for dairy processing facilities on small farms.

With the turn of the century, the major information products of Hometown Creamery Revival will become available. An annotated dairy bibliography, entitled *The Small Dairy Resource Book*, is currently undergoing final editing and will be published by the Sustainable Agriculture Network (SAN) very soon. We have collected most of the information for a descriptive booklet on value-adding facilities; this will be compiled and sent to press over the next few months. A "Getting Started in Dairy Processing" manual should be completed by mid-year.

We have learned much. Several of our farm families have found that entering dairy processing does not fit into their current situations, either because of the huge commitments in time and money required, or because they have found alternatives that are lucrative. As one dairy equipment dealer described the current interest in on-farm processing, "There are a lot of window shoppers out there." Nevertheless, the two farms that are actively making and selling cheese have both expanded their businesses and made their products available to more consumers this year, providing excellent models for others interested in producing value-added dairy products.

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## Regionally Centered Sustainable Agriculture System

John and Barbara Kling's 340 acre farm borders scenic Toole Creek in the Appalachian Mountains of southwestern Virginia. Along with their two children and four grandchildren, the Klings manage a diversified operation that includes livestock, organic produce, niche market products and forest resources. This diversity is ecologically based and economically driven.

Among the enterprises you'll find on the Klings farm are lamb and wool, elephant garlic, garlic braids and a unique and delightful garlic jelly. Additionally, they raise five different fruits and vegetables organically and produce nine types of peppers for two specialty pepper products developed by another local farmer, for sale to a major national retail catalog. Some of the timber from their 60 acres of forestland is used on-farm, while the rest is sold to Appalachian Sustainable Development for drying in its solar kiln. Like most small farmers the Klings struggle to make ends meet, keeping many irons in the fire, creatively using limited resources to keep their farm and household running.

Along with 30 other small scale farmers and dozens of agricultural product entrepreneurs, the Kling family is part of a rapidly growing effort to rejuvenate the Central Appalachian economy through locally based, ecologically healthy enterprises. One of the catalysts in this "sustainable development" ferment is a regional non profit organization called Appalachian Sustainable Development, or ASD. Begun in October, 1995 ASD is an action oriented organization comprised of farmers, loggers, entrepreneurs, community-based organizations, environmental groups, and economic development agencies. This unlikely association of interests initially came together around a simple but enormously challenging question: How can we diversify and strengthen our region's economy and better conserve our environment?

In this context, ASD initiated a project to develop a more regionally centered sustainable agriculture system in the Central Appalachian region, boosted by a \$173,240 grant from USDA's Sustainable Agriculture Research and Education program. ASD's main partners in this effort included: Rural Resources (Greeneville, TN), Jubilee Project (Hancock County, TN), the Lonesome Pine Office on Youth (Wise County, VA), Cooperative Extension staff of both VA and TN,

local staff from the Natural Resource Conservation Service and Resource Conservation and Development Districts, faculty and researchers from Virginia State University, Virginia Tech, University of Tennessee, East Tennessee State University and Walters State Community College, along with several lead farmers. The two and a half year long project also garnered support from the Appalachian Regional Commission, the W. K. Kellogg Foundation, the Jessie Smith Noyes Foundation, the James C. Penney Foundation, and the Virginia Environmental Endowment.

### Objectives

1. Increase the understanding and use of sustainable agriculture practices among farmers, especially limited resource producers, tobacco farmers, and those in transition from more conventional farm practices. A broad range of farm-based educational activities, along with ongoing technical assistance and farmer led research were used to address this objective.

2. Build a cadre of innovative farmers in the region, closely linked to Cooperative Extension and regional universities, in order to create an ongoing learning and teaching capacity for sustainable agriculture in the region.

3. Increase public understanding of sustainable agriculture and develop high value markets for local sustainable products. These markets were to include community supported agriculture programs, retail farmers markets, partnerships with grocers and other wholesale vendors, and specialty markets.

4. Increase the viability of farming and agricultural entrepreneurship in the region in order to reduce the loss of farmland and farmers and to help diversify and revitalize the region's economy.

### Results

The most significant accomplishments achieved through this project included the following:

Forty nine workshops were held, attended by over 1200 people, covering a wide range of topics including livestock production and management, crop production, disease, pest and soil fertility management, value added products, and marketing. Additionally, the first

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Southern Appalachian Sustainable Agriculture conference was held in February, 1999, with a second conference planned for March, 2000. Overall evaluation of workshops, farm field days and the conference were very strong, with many repeat attendees.

There was a substantial increase in sustainable/organic production over the two and half years: *the number of certified organic farmers increased from just one to 18 in the region, with another 10-12 utilizing biological or low input practices* for crop and livestock production. Ten demonstrations sites were initiated on farms in five counties throughout the region, providing opportunities for hands-on continuing education in sustainable production methods.

A research and technical assistance core group was built, drawing in local and regional Extension staff, and faculty and researchers from four universities in Tennessee and Virginia. This group offers a long term commitment of expertise in commercial fruit and vegetable production, specialty crops, agriculture marketing, and sustainable livestock production.

A region-wide analysis of consumer food preferences and buying habits documented wide spread, strong interest in local/sustainably produced meats and produce. It has been used to help build and cement partnerships with consumers and institutional buyers.

*The network of biological and organic farmers raising produce for market more than doubled, from 12 to 30, including at least six limited resource farmers.*

The Central Appalachian region's first commercial "kitchen incubator" was completed at the Jubilee Center in Hancock County, Tennessee. This is providing opportunities for start-up entrepreneurs to test and develop high value agricultural products.

Two other communities in the region initiated partnerships with existing facilities to provide opportunities for development and testing of preserved food products.

A partnership with a locally based grocery chain – Whites Fresh Foods – was initiated, the first time a grocer in the region allocated a designated section for locally produced, organic farm products. Using the name *Appalachian Harvest*, locally raised organic produce was included in seven stores in the East Tennessee region. This should expand

to additional stores in 2000 and will eventually include value added products and meats.

Although the project results are in many ways preliminary, there have been a number of benefits to farmers and consumers growing out of these efforts. To farmers, these include:

- Increased understanding and improved research on a variety of sustainable production issues, such as control of tomato blight, cucumber beetle, Colorado potato and Mexican bean beetles, organic soil fertility, pasture health and weed management, low cost water and fencing systems for intensive grazing, multi species grazing, and use of warm season grasses for enhanced livestock production.

- A widely dispersed group of farmer-innovators demonstrating one or more of these sustainable agriculture practices and accumulating knowledge to share with other farmers in the region. In fact, at least five "sustainable farming hubs" developed during the project wherein one farmer's innovation has garnered interest in new practices among several neighboring farmers.

- Increased market access for organic and sustainable farm products.

Increased availability of education, technical assistance and expertise from researchers in sustainable production practices.

- Facilities and technical help to begin the development of commercial specialty food products.

To consumers, the benefits include:

- Much more widely available organic produce in the region.

- Increased availability of sustainably produced meat products, particularly beef and lamb, and to a lesser degree, poultry.

- Increased opportunities to visit innovative farm operations and to access materials on sustainable agriculture.



## Impacts on Agricultural System Sustainability from Structural Change in Peanut, Poultry, Swine and Tobacco Production Systems

Project collaborators are using secondary database analysis and coordinated case studies to examine four major Southern farm commodities—poultry, hogs, tobacco, peanuts—to analyze major trends; to assess the impacts of these trends on the structure of agriculture, community well-being, and environmental protection; to determine reasons for both success and failure as farmers attempt sustainable agriculture processes (including diversification); and to outline resources needed by farmers in adapting to major trends. Trends to be analyzed include changes in government programs and regulations, trade agreements, market-driven structural changes, and shifting consumer demands.

### Objectives

1.) Document changes in the structure of the peanut commodity system and the responses of peanut farmers to these changes, with a focus on a peanut growing region and associated rural communities;

2.) Document the effects of vertically integrated contract poultry production on the lives and livelihoods of contract poultry farmers and their communities, including documenting the failure of a “free-range” poultry business in North Carolina and conducting a follow-up study of Louisiana poultry communities;

3.) Document changes in the structure of the tobacco commodity system, the responses of Kentucky and North Carolina tobacco farmers, and how structural shifts are affecting the quality of life in tobacco communities;

4.) Identify changes in the structure of agriculture correlated with the development of intensive hog confinement agriculture in Eastern North Carolina and the associated changes in community quality of life, paying special attention to changes in social capital and community conflict.

### Results

Accomplishment to date include collection of secondary databases, literature review, and data collection from case studies through surveys, interviews, focus groups, community meetings and field notes. Data is now being analyzed and commodity chapters of a final report written. Project collaborators will then meet to

synthesize the chapters and write an executive summary. The project is designed to help farmers and technical assistance providers adapt to structural change in these four key agricultural production systems.

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## Equal Access to Agricultural Programs and Opportunities

Minority farmers, facing farm crises, discrimination, and neglect, are seemingly on a long road to extinction. With them goes the largest source of minority-held equity in the South, and an important base of economic development. However, groups seeking to combat this trend believe current socioeconomic conditions make it feasible, perhaps even essential, to replant minority farmers and communities on the land.

### Objectives

This project sought to: (1) broaden collaboration among minority and limited resource producers in the South; (2) enhance their participation in USDA sustainable agriculture, marketing and other programs; (3) develop, with USDA, strategies to identify barriers to participation and enhance outreach and services to these producers; and (4) strengthen networks, strategies, collaborative projects and methods to increase the viability and number of minority producers.

### Approach

Collaborators included major minority farm organizations in the South, with cooperation from USDA entities and educational institutions. The Land Loss Prevention Project managed and staffed the program. The training components were coordinated by The Rural Coalition/Coalición Rural, a culturally and regionally diverse alliance of over 100 community-based farm groups, including all those participating in the project. The National Council of Community Based Organizations in Agriculture served as the advisory committee for the program and worked with the USDA and its agencies to develop partnerships and strategies to assure more equitable and effective access to USDA programs and services.

The collaborators have worked closely with USDA on the development and implementation of the Civil Rights Action Team Report and on the National Small Farms Commission Report all with the objective of developing and strengthening partnerships between USDA and community-based organizations. Participating groups worked with the Department to encourage policy makers to waive a Statute of Limitations that prevented USDA from settling outstanding civil rights cases. They have also cooperated to find resources for collaborative

work, including marketing and enhancing minority farm participation in the FSA county committee system and in risk management.

### Results

In the final project period, the participating groups came together for USDA briefings and concerns impacting our communities and work, prepared legal briefs and testified during the March 2 Fairness Hearing in *Pigford v. Glickman*, the African-American farmers civil rights class action case. The groups also conducted two regional training programs on cooperatives and marketing, including use of the internet. Several meetings were held with USDA staff in strategic program improvement. Participants were given small grants for strategic grassroots work to improve local USDA program participation and community food security.

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## **An Integrated Vegetable Production, Postharvest and Marketing System for Limited-resource Farmers in South Georgia**

### **Objectives**

1) Design, test, implement, and disseminate information on 24-hour field to consumer integrated postharvest and marketing systems.

2) Compare the quality of produce and economic performance of the 24-hour system to other important marketing systems practiced by south Georgia vegetable farmers.

3) Develop appropriate production system information leading to the expansion of production systems of limited resource farmers to include nontraditional vegetables.

### **Approach**

In conjunction with the Postharvest Handling Laboratory at the University of Georgia, South Georgia Vegetable Producers Cooperative (SGVPC) members have mapped the flow of winter produce from the field to a retail outlet. During this exercise, project farmers identified strengths and weaknesses in their harvest and postharvest handling systems. Maintaining quality produce over a long production season continues to be a major challenge for cooperative. When the postharvest handling manual is complete, the cooperative members will be able to organize tasks and assign responsibilities for postharvest handling in an efficient, effective and equitable manner. Researchers, outreach personnel and farmers have come together to create the manual in an open, participatory and iterative process. The manual will include harvest and postharvest handling procedures for a wide range of winter and summer vegetables. While the information in the manual will be specific for the SGVPC and their identified market outlets, the procedures to create the manual and its design can be adopted and adapted by other small-scale vegetable farmers seeking the advantages of collective marketing for fresh produce.

### **Results**

The project has also been helpful in defining market forces in various fresh produce outlets for cooperative members. The information, which is still being collected and analyzed, has helped farmers understand regional and national marketing systems' effects on farmgate prices and demand for locally produced fresh vegetables. The question still remains if small-scale, limited

resource farmers can effectively participate in a highly competitive regional and national marketing system. Certainly, SGVPC farmers have shown resilience in overcoming obstacles and taking advantage of opportunities in the fresh produce market place.

Crop diversification continues to receive much attention in the project. After the successful introduction of several alternative cool season crops, project participants have expanded the list of alternative crops to be tested to include chinese vegetables. The demand for chinese vegetables in Atlanta has been identified as a potential market for SGVPC farmers. All alternative vegetable crops will continue to be evaluated.

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## Producers Assessment of Sustainable Land Management Practices to Protect Water Quality

Our team of agricultural producers, educators, researchers, and students developed this project to determine sustainable management practices that protect water quality and to identify incentives needed for producers to adopt such practices. To do this, we work toward four objectives:

*Objective 1: Assess spatial and temporal distribution of N and P in the Rose and Greenbrier Creek watersheds, as related to land management practices.* We have collected stream base flow quality data (nitrate, ammonium, orthophosphate, total nitrate, total phosphorus, pH and temperature) on first through fourth order segments of the Greenbrier and Rose Creeks since December 1998 for 14 management systems. The management systems represented are grazing land, cropland, forests, poultry, and dairy. We have also collected runoff and stream event flow quality data for the management systems with small in-field runoff collectors and rising flow samplers in the streams on cooperators' farms and research plots since May of 1998. We have had a very dry year which resulted in fewer than normal runoff events (5 runoff events in 1999 compared to an annual average of 13) and a few of the streams drying out for short periods. We continue to gain new cooperators to add management practices or to sample critical locations within the watersheds. Stream networks and watershed boundaries were digitized from digital raster graphics. Digital elevation models (DEMs, 30-m resolution) were imported, rectified, and joined. In addition, a global positioning system (GPS) was used to gather positional data on some of research plots with known contributing areas (2-m resolution). A comparative analysis of several computer techniques for identifying contributing area showed that some techniques could identify contributing areas within less than 1.0 % of the known contributing areas.

*Objective 2: Compare volunteer water quality data collection to technician data collection, and test kit measurement of N and P concentrations to laboratory analysis of the same samples.* Test kits were collected and re-calibrated in the laboratory for the second set of reagents for quality assurance. Farmers and new volunteers continue to be trained. We developed a method to

standardize shaking time for nitrate determinations. Comparative analysis of turbidity, both nephelometric and colorimetric, with total suspended sediments has been done with both base flow and events flow stream samples.

*Objective 3: Evaluate incentives needed to encourage producer adoption of sustainable management practices.* A pre-survey about land use/land management impacts on water quality was developed and administered to project participants (farmers, researchers, educators, students). New participants complete the survey prior to beginning work on the project. In addition farmer results of Farm-A-Syst reports are being compared to water quality impacts (nutrient concentrations coming in the farm minus nutrient concentrations leaving the farm).

*Objective 4: Increase awareness among agricultural producers, youth, and the community of nutrient movement through the environment and of potential impacts on water quality.* Scientists and educators from the project have participated in UGA Extension Winter School sharing information from the workbook "Nutrient Cycles in the Southern Piedmont" and describing how this participatory project involves farmers in monitoring their management practices to determine which methods are working and which methods may need some modification. Sampling protocols and test kit procedures were also described. Visitors from Ethiopia and Senegal came to the Rose and Greenbrier Creeks to use this project as a model for participatory projects they are trying to create. Farmers helped in the demonstrations and were able to find commonalities in each others work. An FFA student is a volunteer on the project.

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## Integration of Freshwater Prawn Nursery and Growout System Into Diversified Farm Systems

The U.S. imports over \$2.5 billion in shrimp products each year. To address this demand, the culture of a freshwater prawns is being evaluated.

### Objectives

1.) Determine whether indigenous zooplankton have potential as supplemental food in prawn nursery tanks. This study was conducted in 20 L aquaria where post-larval prawns were fed supplemental (to a prepared diet) indigenous zooplankton at maintained densities of either 25 or 50/L. Results indicated increased growth in the treatment receiving zooplankton at the high density (50/L). This manuscript is in preparation.

2.) Evaluate the integration of hydroponic vegetable production with prawns during the nursery phase, and growth of tilapia species with Echinacea after prawns are transferred into ponds. Trials were conducted using bibb lettuce and sweet basil. Prawns were evaluated at 0, 5 and 10/L. Vegetables grew significantly larger with prawns stocked at 10/L. Sweet basil had improved growth compared to bibb lettuce due to greater heat tolerance. Echinacea growth was greater at a tilapia stocking density of 16 fish/ft<sup>3</sup>, compared to 8 fish/ft<sup>3</sup>. These data will be published in the Kentucky Fish Farming Newsletter.

3.) Evaluate the biologic and economic viability of pond polyculture of freshwater prawns with tilapia in cages, yellow perch in cages, and winter rotation of brook trout in commercial ponds. Tilapia were stocked into 9 cages in a prawn pond and fed one of three diets: unpelleted distillers grains with solubles (DDGS), steam pelleted DDGS or a commercial catfish diet. The commercial catfish diet resulted in improved growth; however, both DDGS diets provided more economical growth due to a 60% reduction in feed costs. For yellow perch average weight and percentage of fish reaching market size was higher for fish stocked at 320 fish/m<sup>3</sup> than for fish stocked at 80 fish/m<sup>3</sup>. Brook trout fingerlings (35g) were stocked at 4,000 fish/acre in November and harvested in April at 3/4 lb. Total production was approximately 2,000 lbs./acre. Each of these trials were successful in increasing pond efficiencies. Polyculture and crop rotation provide prawn producers a way to diversify and intensify pond production.

4.) Determine the effects and interactions of prawn stocking rates and added substrate on

prawn production. Prawns were stocked at two densities, 24,000/acre or 48,000/acre, with or without substrate (80% increase in surface area). Compared to previous recommended culture practices (16,000/acre without substrate), increasing stocking rates to 24,000 with added substrate increased production 38%, feed conversion efficiency 25%, the number of harvestable shrimp (> 20 g) by 47%, and premium shrimp (> 30 g) by 41%. Paper accepted for publication, Journal of the World Aquaculture Society. Field trials of this research at Bluegrass Shrimp Farm yielded 964 lbs/acre in ponds without substrate and 1,672 lbs./acre with substrate.

5.) Evaluate the economics of production of freshwater shrimp. Dr. Timothy Woods has now completed the report: "Kentucky Freshwater Shrimp: Production Economics and Market Development Strategies" (enclosed). Freshwater shrimp appears to offer potential as a viable enterprise in Kentucky. Successful production systems have been established on 20 farms around the state. Enterprise budgets suggest net profits can be reasonably expected to reach \$2,600 per pond acre.

6.) Evaluate different marketing strategies, market potentials, and distribution strategies and methods for different product forms (live, fresh, frozen). Also contained in Dr. Woods report. Consumer research has indicated strong receptivity to the product.

Based primarily on these studies over 20 producers in a three state region are known to be raising freshwater shrimp. Substantial increases are expected for 2000.

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## **An Integrated System of Organic Food Production and Urban Food Waste Recycling Using On-Farm Anaerobic Digestion and Fertigation**

Organic farms are concerned with procuring organic soil amendments while communities need to expand recycling. Food wastes are a rich source of plant nutrients and energy. Generally these wastes are disposed of in landfills where they produce leachates and volatile emissions. Anaerobic digestion of food wastes eliminates these problems and provides an inexpensive source of fertilizer and energy. This is important to organic farmers who pay five to ten times more per pound of nitrogen compared to conventional farmers and have few sources of organic, liquid fertilizer. This two-year project will use anaerobic digestion to recycle urban food waste on-farm.

### **Objectives**

- 1) Implement an integrated system to recycle nutrients and organic matter through on-farm anaerobic digestion of urban food waste;
- 2) Evaluate liquid fraction fertigation methods with regard to biofouling;
- 3) Test the agronomic response to the liquid fraction;
- 4) Determine the economic feasibility and logistics of this concept from waste collection to nutrient reuse;
- 5) Educate farmers, waste haulers, environmental regulators, restaurant owners and extension personnel about this concept.

### **Approach**

An organic farm will receive food waste from restaurants and recycle it using anaerobic digestion, fertigation of the liquid fraction and land application of the solid fraction. Field trials comparing growth responses to the digester liquid fraction and other organic fertilizers will be conducted at two additional farms and one research farm. Training for farmers, educators, food processors, and environmental regulators will occur at field days and workshops. The Cooperative Extension Service will coordinate education with farmers and state and national organic certifying agencies. This practice could provide a new source of liquid, organic fertilizer, create a new revenue source for farmers in the form of on-farm tipping fees, and divert a significant proportion of food waste from landfills.

In the first year of this project we have designed and built a two-ton per week capacity anaerobic digester system. The system is operational and has been producing fertilizer for Possum Hollow Farm. A food waste collection program has been established with a local institutional cafeteria. The fertilizer being produced is being used on the farm. Agronomic and irrigation trials will commence with the new year.

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## Development of Decision Support Systems for Improvement of Silvicultural Practices on Farm-Based Non-Industrial Private Forests

This project on developing models for evaluating intensive forestry for limited income farmers is progressing well, although slightly slower than initially proposed. The project initiation was delayed when the two original Principal Investigators, Steven Colbert and Mark Ducey, left employment at the Department of Forestry at North Carolina State University Department of Forestry to take other positions. Since then, other Co-PIs have assumed leadership of the project, but this has set back the schedule somewhat. Nevertheless, we have accomplished the principal objectives of the study, and are in the stage of reviewing the principal outputs of the project.

**Objective #1:** Assess the attitudes and values of nonindustrial private forest (NIPF) land owners, especially the objectives and factors influencing management

This objective is essentially complete. We have completed literature reviews of nonindustrial private forest (NIPF) landowners in general and an analysis of the factors that motivate them to manage their forest land actively. In addition, we have developed demographic information on the characteristics of NIPF landowners in general and compared them with those of limited income forest landowners, based on general demographic information for the two study states of North Carolina and Georgia.

**Objective #2:** Evaluate the roles of forested lands in limited-resource farming systems

Public input from minority farmers has been gathered at regional meetings and with focus groups at two field sites—one in Georgia and one in North Carolina. We collected informal survey information about forestry practices from limited income and minority farm landowners who attend a rural development conference in Birmingham, AL in January 1998, and from a different set of farm landowners at a similar conference in Tifton, GA in July 1999. We also had a focus group meeting with many minority farm landowners in Tillery, North Carolina, and visited separately with some landowners at the Georgia conference in Tifton. These focus groups and surveys provide the basis for summarizing the desires and interests of limited income and minority farm landowners. Their current forest

practices; desires for technical forestry information; and research and extension needs will be summarized.

**Objective #3:** Build a network of participants to prepare integrated proposal for the 1999 SARE funding cycle

Based on the impetus generated from this SARE grant, a subset of the Co-PIs have already developed a related proposal for the current round of SARE funding, and have been accepted in the pre-proposal stage. A full proposal will be submitted shortly. Additionally, the final completion of this current SARE Project should provide the basis for preparation of proposals for other RFPs or agencies.

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## Development of Sustainable Cropping Systems for Canola on Limited-Resource Farms in Alabama

### Objectives

- 1.) To establish cultural and agronomic production practices of canola.
- 2.) Development of sustainable cropping systems for canola in sequences with other crops;
- 3.) Comparison of conventional and no-till planting systems in canola production in Alabama.
- 4.) Develop information about the economics and profitability of canola.

### Approach

The experiments were conducted at the Winfred Agriculture Research Experiment Station to determine the effect of planting date, seeding and nitrogen rates on yield and oil content of canola. Two planting dates (Sept. 24 and Oct. 15), three seeding rates (1.5, 3 and 6 kg ha<sup>-1</sup>) and four nitrogen rates (0, 60, 120 and 180 kg ha<sup>-1</sup>) were used. Higher seed yields were consistently achieved from the late date (Oct 15) of planting. Highest yields of 2,414 and 2,678 kg ha<sup>-1</sup> were obtained at 120- and 180 kg N ha<sup>-1</sup> from plots with seeding rates of 3 and 6 kg ha<sup>-1</sup> respectively. Data on test weight of seed and oil content did not vary significantly among treatments. Seeds per pod, seed weight and pods per plant were positively associated with seed yield. No interactions were found among planting dates, seeding and nitrogen rates for any of the yield components studied.

Since canola is a winter crop, it fits well in rotation with southeastern-summer crops, and is complimentary with winter wheat. The replicated trial of canola crop (cultivar Jetton) was planted alone, in strips along side with wheat, after corn, sorghum, bullrush millet, canola and soybeans. Data obtained from these different rotation systems showed that significant differences exist for seedling emergence (plants m<sup>-2</sup>), blackleg disease, height and seed yield. Emergence was highest in rotation with soybean groups IV and V (47 and 34 plants m<sup>-2</sup>). Blackleg disease rating was highest (2.7, on a scale from 1 to 3) when canola followed canola, while no disease was present when canola was rotated with other crops. Seed yield of 2,878 kg ha<sup>-1</sup> obtained in rotation with group IV soybean was significantly greater than yields of 1,474 and 1,360 kg ha<sup>-1</sup> for rotation with corn

and canola, respectively. Canola yield was higher or equal when compared with wheat. The canola produced an economic yield in north Alabama when rotated with other summer crops.

Two demonstrations on the planting of canola were managed on private farms. One farmer at his location used conventional cultural practices, while the other farmer used no-till practice following soybean. Seed yield on the limited resource farm ranged from 2,018 to 4,012 Kg ha<sup>-1</sup> on the conventionally planted canola in rotation with soybeans. The no-till planted canola on the small farmer's field produced an excellent stand in the fall, but failed to produce a successful crop due to herbicide residual effect from the previous soybean crop.

Information on the two demonstrations on private limited resource farms are provided to our cooperators in the Department of Agricultural Economics, at Alabama A&M University in order to fulfill objective number four.

Two more years are needed to carry out specific experiments on weed control, and evaluation of spring type canola in north Alabama. This project is providing information on production practices on canola, its use as a sustainable crop with other summer crops, and also as an alternate or companion crop for winter wheat.

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SARE grant \$124,488



## Accountability at Local, State and Federal Levels for Impacts of Agricultural Conservation Practices on Water Quality

Policies of the 1996 Farm Bill addressed many natural resource concerns and mandated programs to support animal-based agriculture and grazing land management. Soil and Water Conservation Districts (SWCD) work through Local Work Groups to identify high-priority natural resource problems and propose solutions using funds from the Environmental Quality Improvement Program (EQIP). Under the Government Performance Reform Act, federal conservation programs must be evaluated with measurements relating to the quality of natural resources.

### Objectives

- 1.) Work within two FY97 EQIP Priority Watersheds to monitor impact on water quality as funded conservation practices are installed.
- 2.) Examine monitoring methods at three geographic scales to develop strategies for use by local, state, and federal agencies.
- 3.) Conduct training for SWCD supervisors, farmers, staff members of NRCS, Georgia EPD, and other agencies to demonstrate sampling strategies.

### Accomplishments

Two valuable sources of baseline data were found to supplement our work within the Upper Oconee Watershed of Georgia. These data have provided observations for establishing baseline values and testing for efficacy of funded agricultural conservation practices. These data were used to test for impact of agricultural land use in selected portions of the watershed.

At the Conservation Center, sites have been selected and water quality samples have been tested for a year for total coliforms, *E. coli*, and enterococci bacteria moving from grazing lands and forested areas into surface waters. Analysis for *E. coli* and enterococci seem to be more useful in identifying the effects of grazing animals in a watershed. A pond in the grazed watershed was effective for reducing concentrations of *E. coli* and enterococci bacteria in surface waters. The mean numbers of *E. coli* and enterococci flowing from the pond were lower than the numbers of these pathogens in a creek in a wooded area without domestic animals.

Sampling has begun through out the Upper Oconee Watershed. Nine sites were selected in

the headwaters of the watershed and 9 sites were selected west of a recreational lake near an area that is reported to have been impacted by agricultural land use. In addition, 7 sites were selected to aid in the characterization of a smaller portion of the watershed in which another SARE project is active.

The communication of activities of this project [ORBACE (Oconee River Basin Agricultural Conservation Efficacy)], are facilitated with a World Wide Web page located at the following URL; <http://www.spcru.ars.usda.gov/orbace1.html>.

Graduate students working with Dr. Usery at UGA have begun the geospatial analysis that will be important in the interpretation of the result of our water quality samples. Satellite photos have been purchased with ARS funds and provided to UGA for watershed analysis.

### Remaining Work

Sampling sites have been located within the watershed and regular sampling has begun. This must now be continued for the duration of the project. Designed intensive experiments on the Conservation Center are being planned with automatic sampling equipment. A temporary employee has been hired to assist in sample processing.

### Benefits to Farmers and Consumers

The greatest benefit to farmers will be an objective analysis of the efficacy of conservation practices. We have already shown that farm ponds can be effective in limiting the movement of microbes from grazing lands. Animals may be positioned above the pond during periods likely to produce runoff. This is especially relevant during January and February while cows are calving, rainfall is high, and evapo-transpiration is low. For consumers, cleaner water will decrease health risks from fecal pathogens found in domestic animal manures and a reduced risk of eutrophication of water needed for municipal supplies and recreational water bodies.

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**SARE Grant \$233,322**





## **A Model for Long-Term, Large-Scale Systems Research Directed Toward Agricultural Sustainability**

The project is located at the Center for Environmental Farming Systems which is dedicated to the study of farming systems that are environmentally, economically, and socially sustainable. The Center is a collaboration between NCSU, NCA&TSU, NCDA, and other state and federal agencies, farmer and other NGO groups, and citizens. This three year project is to establish in perpetuity a multidisciplinary systems research project evaluating five diverse agricultural systems, through the collaboration of a broad coalition of researchers, extension personnel, farmers and stakeholders.

### **Objectives**

- 1.) Selection of sites and conduct of baseline sampling.
- 2.) Formation of a Research Advisory Board.
- 3.) Establishment of systems and begin data collection.
- 4.) Construction of a systems model.
- 5.) Outreach and information dissemination of project outcomes.

The systems are being evaluated on numerous integrating parameters including, energy and nutrient flows within the plant-soil system, biological-based shifts, and economic performance evaluations. Cover-crop rye was planted in November 1998 and data collection began in March with baseline soil sampling. Five points were chosen randomly in each plot along a transect line. These points were then physically marked and geo-referenced. At each sample site, a composite of 18, 2.54-cm in diameter by 15-cm deep cores were taken adjacent to the plant row (avoiding traffic compaction) in a random manner near the flag and mixed thoroughly. The same sample was used for chemical (pH, organic C,  $\text{NO}_3$  and  $\text{NH}_4\text{-N}$ ) analyses and for quantifying entomopathogenic nematode and bacterial (*Pseudomonas*) populations. Research also included measurements of soil water content, bulk density, infiltration time and respiration as measured by  $\text{CO}_2$  evolution.

Ultimately, our goal at CEFS is to develop a set of key soil quality indicators that reflect current and future systems performance potential. A second soil sampling was completed in November 1999. Crop rotations were initiated in April and May with planting of corn, pastures and soybeans.

Hurricane (Floyd) damage from flooding has been significant. Soybeans, some corn and some of the pastures were lost. A final damage appraisal is yet to be made.

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**SARE grant \$256,604**



## Intergenerational Education for Sustainable Agriculture

### Objectives

1) Introduce the concepts of sustainable agriculture and its impacts on our environment, economy and community to students and teachers in our public school systems by establishing on-site educational gardens at pilot schools and in community gardens in six states.

2) Integrate local family farmers —especially limited resource farmers —and other farming professionals into educational activities at these pilot schools through the development of hands-on curricula for science, mathematics, literacy, economics, social skills, history and art based on sustainable agriculture activities. These farmers and professionals will be introduced to students as role models for viable career paths and occupational choices.

3) Create a regional network, which could expand to a national network, that promotes sustainable agriculture education for young people by establishing linkages between the participants so they can communicate with and learn from each other.

4) Disseminate program results to other educational professionals and agricultural information providers so that successful programs can be adapted in other school systems and educational settings.

### Approach

To date, seven organizations — Dunbar Garden Project, Roots and Shoots Project, Sustainable Food Center, Carolina Farm Stewardship Association, Virginia Male Adolescent Network, Surry Office on Youth, and the Federation of Southern Cooperatives Training Center — have participated in a process to develop five year plans for their youth education programs. The three programs with already established gardens bolstered their programs through this project with increased farmer, teacher and student participation. Two other programs created new gardens and began educational activities on sustainable agriculture. The other two organizations continued to plan and look for partners to help them get their programs off the ground.

Farmers, teachers, and youth from six of the organizations attended the Southern SAWG annual conference in January 1998 to network with each other, participate in model educational activities, and share curricula ideas. Additionally, training materials and curricula have been shared among all groups since the conference.

Savanah Williams has done extensive networking with other sustainable agriculture youth education projects from both within the Southern region and beyond to begin the work of linking programs and sharing information.

Work left to be done includes: 1) establishment of educational activities at two sites, 2) further identification of appropriate curricula and development of new curricula to fill gaps, 3) further inclusion of sustainable farmers in the pilot school and community programs, 4) further training for teachers and other educators at each site, 5) conducting meetings with other youth education programs to assess their needs and interest in creating a network, 6) assessing the lessons learned and materials generated from each pilot site to distribute to others who are interested, and 7) continued planning at each site to develop steps that will lead to self-sufficiency and long-term sustainability for the individual programs.

By offering more educational opportunities in the principles and practices of sustainable agriculture to youth and by exposing young people to farmers using sustainable practices, we will increase the understanding and support for sustainable agriculture among the general population. In addition, these educational programs should interest more young people into pursuing an occupation in the field of sustainable agriculture. The more good minds that we have in our field, the better we will be able to solve problems for all family farmers.

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**SARE grant \$176,240**





## **Integrating Farmer-Driven, Value-Added Enterprises into Sustainable Agriculture Systems**

### **Objectives**

1.) Lay a foundation of information and support that will help accelerate farmer-driven, value-added enterprise development for sustainably produced farm products in the Southern region.

2.) Gather base-line information on the systems and concepts that are keys to the successful development and marketing of farmer-driven, value-added agricultural products. Disseminate this information to farmers, agricultural information providers, researchers and educators in the region.

3.) Establish an information bank of programs, services, facilities, and other business and entrepreneurial resources supportive of farmer-driven, value-added enterprises.

Make the information accessible to farmers, agricultural information providers, researchers and educators in the region.

4.) Develop and test a model incubator service designed to provide information and training to sustainable farmers and farm-based entrepreneurs about business and marketing in a one-stop setting when and where they need it. Provide information about this model to farmers, agricultural information providers, researchers and educators in the region.

To date, we have completed an extensive search to identify farm-based enterprises in the Southern region that are adding value to sustainable agricultural products. Most of these enterprises are owned and managed by individual farmers.

Through correspondence and phone interviews, we have compiled demographic information on nearly 60 of these enterprises representing a wide range of products and producers. We have developed a survey instrument, tested it, and begun in-depth interviews with each of the managers of these value-added enterprises.

We have also begun contacting organizations and institutions that have resources pertaining to value-adding, business entrepreneurship, and marketing for small businesses.

In the next 2-3 years we expect to: 1) complete the enterprise survey and produce a report, 2) complete an inventory of resources and produce a resource list, 3) develop a model incubator service, 4) identify five clients to apply

and test the incubator service, 5) evaluate and make recommendations for continuing service, 6) disseminate reports and recommendations, and 7) identify funding for continuing service, if needed.

We expect this project to increase the awareness and expertise about farmer-driven, value-added enterprise development in our region. As more enterprises are created, economic activity on family farms will increase and the quality of life will be enhanced for farm residents. Perhaps as importantly, this project will begin laying the foundation for programs and research that substantially enhance one of the tenets of sustainable agriculture — economic viability. By giving farmers and rural community leaders the business tools and resources for adding value to agricultural products, innovative entrepreneurial activities can be more easily incorporated into whole sustainable farming systems.

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**SARE grant: \$120,590**



## Introducing Alternative Crops into Traditional Cotton-Grain Farming to Aid Transition to Freedom-to-Farm Agriculture

### Objectives

1.) Design and evaluate cotton-southernpea-chile pepper-grain sorghum rotations to maximize sustainability.

2.) Identify cultural practices that optimize chile pepper establishment and growth.

3.) Develop management practices that reduce chemical applications while enhancing soil health.

4.) Demonstrate on-farm adaptive research and disseminate results to growers.

5.) Evaluate direct impact of rotations on the rhizosphere, crop productivity, farm income and social structure.

### Work accomplished to date:

Met with cooperating growers to review objectives and roles, set priorities for 1999 work, and discuss timing of work.

Established working relationships with two commercial cotton/vegetable farmers and two market gardeners. Each farmer committed four fields to a four-year crop rotation.

During the winter and spring, identified field problems that must be solved to make the rotation system feasible. Designed and implemented studies to solve these problems:

1) Growers felt fertility variations and seedbed crusting reduced chile stands. We collected 20 soil samples representing the 0-8 inch depth at 10 locations in each field. In several fields, soluble salt levels were high enough to inhibit pepper and southernpea seedling growth. CIAPSE scientists identified remediation strategies. Nematode and pathogenic microbe activity in 8 fields was too low to have any adverse effect on plant growth.

2) Poor pepper plant stands from direct field seeding result from wind damage and soil drying. We designed and planted two windbreak systems: 1) two rows of March-planted oats and April-planted tall-growing grain sorghum between the rows between each 16 rows of pepper; 2) two double rows of sunflower planted every 16 rows in two fields of chile and summer squash. Effects of an oat/ sorghum windbreak system on chile pepper yields were measured.

3) Growers had difficulty handling and setting thousands of pepper transplants for optimum readiness of field and weather. We helped two growers develop a row cover transplant production system

which produced over 24,000 chile transplants and compared field performance with Speedling transplants and direct seeded pepper. Transplants of six varieties were evaluated in a replicated study for yield and suitability for mechanical harvest.

4) Some fields had very high pH (8.2 to 8.4) causing southernpeas to exhibit iron deficiency. Six southernpea varieties having varying tolerance of high pH soils were grown in a replicated study. All four growers planted southernpeas.

5) Summer germinating amaranth (pigweed) plants compete with peppers and inhibit mechanical harvest. Herbicides to control summer germinating amaranth, spare chile plants, and leave no residue were studied. IR-4 assistance was requested.

6) Growers have difficulty scheduling irrigations to prevent water stress in chile. We assisted one grower in managing a drip irrigation system installed in four 5-acre sets so that a 4-year rotation can be maintained. In 1999, 15 acres of cotton and five acres of chile pepper were planted here. Tensiometers used to schedule irrigations.

TV and radio interviews publicized establishment and progress of our work. Presentations on this project will be made the National Pepper Conference, West Texas Vegetable Conference, and American Society for Horticultural Science – Southern Region meeting in Lexington, KY.

Work left to do: Installation of weather station, irrigation timing, nitrogen rate study, intensified windbreak evaluation, and transplant production/water management.

How project will benefit farmers and consumers: Successful establishment of a 4-year rotation of cotton-grain sorghum-southernpeas-peppers (as compared to cotton monoculture) will enable farmers to sustain profitable farming systems, compete more effectively with imported agricultural products, enhance soil health and provide consumers with more Texas-grown vegetable products.

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**SARE grant \$114,279**





## Organic Vegetable Production for Limited-Resource Farmers

Small, limited-resource farmers often find it difficult to compete in today's economy as evidenced by the decline in numbers of small farms for the past 50 years. Organic vegetable farming is expanding and may be ideal for limited-resource farmers; however, organic farming is new to many farmers. The goal of this planning project is to develop a full research/education proposal(s) that will use organic vegetable production to increase incomes of limited-resource farmers and advance sustainable agriculture. This will reduce the loss of small farms and help preserve soil and water resources by reducing agricultural chemical inputs.

### Objectives

- 1.) Determine what research and educational information is most needed by organic farmers and what means of information dissemination is preferred.
- 2.) Assemble a multi disciplinary team to address research and educational needs identified by organic vegetable farmers.
- 3.) Provide organic vegetable farmers with successful marketing strategies.
- 4.) Identify organic vegetable farmers to participate in on-farm research and demonstrations.
- 5.) Prepare a proposal that will provide research and education needed by organic vegetable farmers.

### Approach

Research and education needs relating to organic farming will be solicited from small farmers at meetings and by surveys. A multi disciplinary team of professionals will be assembled from different universities, government agencies, and the private sector to address the research and education needs identified by the farmers, including marketing strategies. Farmers will be selected for on-farm research and demonstrations based on their perceived problems, resources, location, and willingness to cooperate. Finally, a proposal will be developed in which the multi disciplinary professional team addresses the needs of the farmers using on-farm research and educational methods desired by farmers. Results from an eventual proposal would be disseminated in Extension bulletins, scientific journals, and by means most preferred by farmers.

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**SARE grant \$19,100**



## Economic and Environmental Effects of Compost Use for Sustainable Vegetable Production

The value of compost in improving soil properties has been documented, but transitional and conventional farmers are hesitant to substitute compost for inorganic fertilizers or manures because the long-term agronomic and economic benefits are unknown. The agronomic and economic value of using compost may be enhanced if environmental advantages over commercial fertilizer and manure can be demonstrated. The goal of this project is to compare the economic and environmental (agronomic and soil and water quality) effects of compost, manure and inorganic fertilizers for the production of vegetable at two commercial organic farms and one university research and education center. Specifically, we will:

1.) Assess the effects of compost, manure, and fertilizer on soil biological, chemical and physical properties indicative of soil quality. (Agronomic)

2.) Assess the effects of compost, manure and fertilizer on nutrient leaching and runoff. (Environmental)

3.) Assess the effects of compost, manure and fertilizer on average yield levels and net economic returns as well as on the variability of both yield and net economic returns over multiple production periods. (Economic)

Farmers will implement their normal practices on fields that will contain experimental plots. Researchers and farmers will add soil amendments, measure changes in soil and water quality; determine crop yields; and assess the economic and environmental effects of the treatments for a minimum of three years. The results will provide the most definitive analysis of inorganic versus organic fertilizers to date, including the quantification of non-nutrient and environmental value, in the interest of enabling farmers to learn how to credit the value of compost and promoting compost use among farmers. We will summarize and present results as SARE reports, fact sheets, scientific manuscripts and at on-farm field days and agricultural and composting conferences.

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**SARE grant \$153,969**





## **Systems for Sustainability of Alfalfa Production on Arid, Coastal Plain Soils Using Various Harvesting Strategies**

Stakeholders in livestock production on Coastal Plain soils in the southern U.S. are bound to grass-dominated ecosystems that require high N rates that acidify soils. Use of a sustainable, perennial legume such as alfalfa offers the opportunity to break this cycle, but to date, alfalfa has not been a sustainable forage on Coastal Plain soils due to its root-growth sensitivity to soil acidity. Alfalfa hay is currently imported into the southern region of the U.S. from western and midwestern states. We have researched nutrient management for sustained alfalfa growth on Coastal Plain soils. Toxic levels of subsoil aluminum (Al) can severely restrict sustainability of alfalfa in this humid region. Development of grazing-tolerant alfalfa varieties has renewed stakeholder interest in using this high-feed-value legume in holistic forage production systems. With the cooperative partnership of stakeholders and universities, we will develop risk-assessment models that may be applied to specific farm situations to quantify biological and economic efficiencies of alfalfa.

### **Objectives**

1.) Develop a soil amendment and nutrient management plan to enhance establishment and sustainability of alfalfa on acid, Coastal Plain soils by determining the extent of phytotoxic Al in soils and evaluating amendment effects on reducing Al toxicity

2.) Evaluate multiple-option defoliation strategies using hay, silage, greenchop, and/or grazing to improve stand survival and sustainability of alfalfa on stakeholder and university farms on the Coastal Plain

3.) Develop risk assessment models to project economic benefits from alfalfa production on Coastal Plain soils by application of results from proposed and previous research

4.) Use a variety of the latest technologies to transfer best management practices to stakeholders in the southern U.S. Results will be disseminated to end-users through field days, meetings, and articles in bulletins, newspapers, agricultural journals, Internet, and radio and television newscasts. Detailed production guidelines, risk management options, and economics will be combined into a video for use by stakeholders.

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**SARE grant \$149,750**



## Developing Effective Methods to Assess the Impact of Community Food Security Programs on Purchase of Local Farm Produce

Neighborhood Nutrition Network (NNN) of Gainesville, Florida, North Florida Educational Development Corporation (NFEDC) of Gretna, Florida and Baton Rouge Economic and Agriculture Development Cooperation (BREADA) of Baton Rouge, Louisiana make up the SSARE planning grant team. We are planning how to implement an effective evaluation of our community food security programming. The main goal of the planning grant is to develop a research proposal to study the impacts of our community food security programming on purchases of local farm produce.

### Objectives

- 1) Develop the project collaborators' capacities for self-evaluation of their programs,
- 2) Develop a sound research design to measure the impacts of three typical components (community gardening, gleaning, and nutrition education) of community food security programs on sales of local farm produce in three different Southern communities; and
- 3) Promote a multi-stakeholder, multi-institutional, and interdisciplinary network supporting the integration of local agriculture, social service, and community development planning.

### Work Accomplished to Date

The planning team of the three cooperating community-based organizations have scheduled a training for participatory planning evaluation called, "Planning Evaluations for Community Food Security Programs; do our programs impact purchases of locally produced food?" The training will be January 25 and 26, 2000. Ms. Jennifer Kpuscik, evaluation planner of Tufts University and Dr. Hugh Joseph, nutrition education, Tufts University, will lead the training in Gainesville, Florida. The SSARE planning team have planned the training agenda through conference calls and guidance of our local collaborators. Local trainers also include project collaborators, agricultural economist Dr. David Zimet, social scientist Ms. Glenda Warren, healthcare researcher, Kristen Smith, and Community Green Market president, Charlie Lybrand. The training audience is made up of the planning team community leaders and staff, farmers, and community leaders from the planning team's partnering organizations.

The agenda includes the following topics:

- Evaluations in local food systems,
- The context of a local food systems,
- Food assessments: gathering data for planning and evaluation,
  - Evaluation Models and Structures.
  - Community involved research and education,
    - Six steps in planning an evaluation (1) Defining a purpose, 2) setting the focus, 3) collecting information, 4) planning of implementation, 5) analyzing and organizing data, and 6) the follow-up plan. These are the six steps in Heifer International Projects' participatory approach to evaluation.
- Helpful and practical evaluation tools for farmers

### Work Left to Do

The training will include small group discussion and work sessions. We plan to leave the training with 1) the tools to plan and then implement an evaluation, and 2) a working plan to complete our proposed research design and outreach plan.

### Benefits to Farmers and Consumers

We also expect that our planning and emerging research project will help create a sound basis for the development of community food security programming that benefits local, small, and family farmers and rural communities.

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**SARE grant \$20,000**





## A Sustainable Integrated Production System for Native Pecan and Beef Cattle Producers

Over 150,000 acres of native pecan trees grow along river bottoms in the eastern half of OK, southwest AR and east TX. The rivers in this area are subject to surface and ground water contamination from pesticides and nitrogen (N) fertilizer. Pecans are a high input crop with growers often applying 150 lbs of N per acre and 6 to 8 applications of pesticides each year. Nearly half of all native pecan groves are also grazed by livestock. This project will demonstrate to pecan growers the establishment and management of legumes, pecan weevil monitoring and pest management systems in conjunction with livestock grazing and pilot test the usability of a previously developed weather driven pecan scab model available on the world wide web. The target audiences for this integrated systems project are pecan growers and Extension personnel. The OK Pecan Growers Association (OPGA) will be a full partner in this work from planning through completion. We will measure the amount of fertilizer and pesticide saved as well as refine the system comprised of pecan/livestock and forage production and evaluate its effect on ecology. Further, we will illustrate the economic impact of the various components of the system thru partial budgeting and use extension educational techniques to foster implementation of the practices among pecan growers.

### Objectives

- 1.) Demonstrate the effects of a legume based grazed native pecan orchard management system on soil N fixation, soil characteristics and beneficial insect attraction.
- 2.) Demonstrate trapping and weather monitoring to schedule pecan weevil and scab spray programs compatible with livestock.
- 3.) Demonstrate a fully integrated and sustainable legume based cow/calf and native pecan production system.
- 4.) Quantify treatment effects on changes to the plant community and estimate the ecological stability and resilience of the plant community.
- 5.) Quantify the economic benefits of legumes, weevil trapping, scab monitoring and grazing in a native pecan management system.

An initial organization/coordination meeting including all participants was held August

18, 1999, in Perkins, OK. At that meeting details of the demonstration were finalized and interaction of various plot activities was identified and all concerns of cooperating farmers were addressed. After the initial meeting, plots were defined and mapped at Haydon Farms and Santifer sites in September.

Objective 1. Legume seeding consisting of red, crimson and ladino clover is complete at both demonstration sites i.e. Santifer Farms, Miller County, AR and Haydon Farms, Okfuskee County, OK. The clover stand is very good at Haydon farms and marginal at Santifer due to limited rainfall. Pre-plant soil samples for nutrient analysis and bulk density have been collected at both sites and are currently under analysis. Electric fence for livestock exclusion is in place at Santifer farms. Technical representative for Gallagher Fencing Company is designing fence for Haydon Farm for installation after harvest.

Objective 2. Circle traps for pecan weevil monitoring were installed in both orchards in early August and monitored three times each week until shuck split which began in late September at Haydon Farms and late October at Santifer Farms.

Objective 3. Field day for the Haydon Farm demonstration is scheduled in conjunction with the Oklahoma Pecan Grower's Association meeting, June 20, 2000. That program will include oral presentations on each phase of the demonstration as well as summarize results to date. An article outlining the demonstration and objectives was published in Pecan South magazine, July 1999 (McCraw, B. D. 1999. SARE project funded for native pecans. Pecan South. 32 (6):8-10.). A copy is at enclosure I to this report.

Objective 4. Initial ecological observations have been made at both demonstration sites and follow up observations are in process.

Objective 5. Time requirements for weevil trap monitoring, legume establishment costs and other activities have been documented. First year pecan yield will be determined from each plot. Harvest was completed at Haydon Farms, Okfuskee County, OK and Santifer Farms, Miller County AR in November 1999.

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**SARE grant \$210,188**



## Pastured Poultry and Vegetable Production

Limited resource farmers often need alternative diversified enterprises, including niche markets, if they are to survive as producers. This project builds upon the pastured poultry model by evaluating the feasibility of production systems integrating vegetable crop production and pastured poultry - either broilers or layers - reared on pasture in floorless pens that are moved daily.

### Objectives

- 1.) Determine the effect of the manure on plant performance at various times after the birds have been on the area;
- 2.) To determine the response of soil fertility and crop yields to manure from previously pastured poultry at the Southern University Horticulture Farm and on producers farms;
- 3.) To carry out economic analyses of the system; and
- 4.) To develop information for producers regarding economic advantages and cultural practices relative to growing vegetables in association with pastured poultry, to recruit new pastured poultry and vegetable producers, and to involve producer organizations in promotion of the program.

### Approach

The first trial for objective 1 has been carried out using mustard greens as the test crop. The plots were tilled immediately after the birds were moved and the crop planted 0, 1, 2 or 3 weeks later. No negative effects of the manure have so far been seen. This trial will be repeated in the Spring of 2000. Trials involving the response of soil fertility and crop yields (Objective 2) and economic analyses (Objective 3) will be initiated in the Spring 2000 growing season. A farmer record book has been drafted to facilitate objective 3.

Outreach activities will include recruitment of farmers to try the program, as well as providing technical assistance and training in integrating poultry and vegetable production, processing, and marketing techniques. Results will be widely disseminated in both the popular and scientific presses and will be presented at field days, farm tours and workshops. Use of vegetables in combination with pastured poultry will increase farm diversity, soil fertility and farm incomes for the farmers.

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**SARE grant \$89,800**





## **Polyculture of Paddlefish with Catfish in the Southern Region**

### **Objectives**

High feed cost is one of the major factors limiting the income of catfish farmers. Paddlefish, a filter feeder, can be produced without prepared diets because it feeds on zooplankton that is abundant in nutrient-rich catfish ponds. The goals of this regional project are to enhance the fish farmers' income through polyculture of paddlefish with catfish, and to diversify fish products in the United States markets. We will take an integrated approach to study the production and marketing of paddlefish within a three-year period.

### **Approach**

Experiment 1 will determine the effects of stocking density on the growth performance of paddlefish in catfish ponds in three different regions of the country.

Experiment 2 will assess consumers' and buyers' acceptability of the smoked paddlefish products, willingness to buy the products and their demographic information.

We expect to observe differences in fish size and yield of paddlefish due to stocking densities and regional variations, and to obtain information from buyers and consumers on acceptability of paddlefish value-added products. The results from this project will provide information that could optimize stocking density of paddlefish, improve profit margins on the catfish farms, diversify fish products in the market place, and alleviate pressures on paddlefish capture fisheries. Information will be disseminated to the end-user communities by newsletter articles, television media releases, fact sheets and workshops, and to the research community by scientific presentations and publications.

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**SARE grant \$140,135.**



## Enhancing Feasibility for Range Poultry Expansion

The production of poultry on pasture can contribute greatly to the development of vibrant and healthy regional food systems. There is strong and growing demand for birds raised locally without medications and in a wholesome, environmentally-sound manner.

In order to expand their enterprises, however, producers need improvements in feasibility assessment and processing infrastructure. This is important because farmers often focus primarily on production without adequately addressing economic feasibility and marketing.

The participants in this project will develop and test a toolbox of resources and a model for feasibility assessment to help producers conduct some or all of their own feasibility studies. To improve the processing infrastructure available to independent poultry producers, HPI Field Representatives will work with state-specific teams of farmers, extensionists, agriculture and health department officials to design, build and test mobile processing units (MPUs) in Kentucky, Alabama and Mississippi.

These MPUs will be state and/or federally approved facilities, thus enabling producers to raise larger numbers of birds and pursue a broader range of marketing opportunities.

Nutritional resources and sources of reliable livestock will also be identified. A legal summary of the regulations related to on-farm processing and marketing in all 50 states will be prepared. The results of all these efforts will be shared with farmers throughout the country via several organizational newsletters, published reports, and field days.

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**SARE grant \$175,740**





## Integrated Crop and Sylvan Systems with Swine

Small scale swine farmers will abandon raising hogs in NC if they don't perceive there are alternative and profitable options to their current practices. With new state animal waste regulations enacted, even small scale producers will need to change their current practices in order to maintain a balance of nutrient inputs and outputs, assure optimum ground water quality and protect against non-point pollution from swine waste runoff.

Farmers may be able to implement practices that enhance environmental stewardship and increase overall income/acre by complying with the new state regulations. A mulch/crop-residue bedding may improve both crop and animal systems by reducing:

- 1) labor and mechanization requirements for composting and tilling
- 2) runoff of waste nutrients and soil, and
- 3) parasite load by providing a drier environment from the mulch bedding.

### Objectives

In collaboration the Carolina Farm Stewardship Association, NC Department of Agriculture, farmers and facilitators will explore avenues to increase profitability by promoting the unique characteristics of their product as well as their production system.

This project will examine:

- 1) potential for adding mulches on dry lots to enhance swine waste utilization in developing organic vegetable plots,
- 2) productivity of gestating sows fed a typical corn/soy diet or one supplemented with forages,
- 3) potential to improve woodlands under two stocking rates of swine and,
- 4) methods for small scale producers to enhance their market share and profitability.

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**SARE grant: \$156,262**



## Ecological, Sustainable and Economic Impact of Legume-based Pasture Systems for Limited-resource, Small-ruminant Farmers

This three year project represents an overall multi-disciplinary effort to develop profitable (reduce costs and purchased inputs), ecologically and environmentally safe, and sustainable small ruminant production systems in the Caribbean.

### Objectives

1.) Compare productivity and profitability of grass-legume mixtures (i.e., *Leucaena*; *Leucaena leucocephala* Lam de Wit.)-(Guineagrass; *Panicum maximum* Jacq.) to N-fertilized guineagrass pastures for sheep production.

2.) Compare plant and animal response to grass-legume combinations (i.e., *Neonotonia wightii*) and native or guineagrass pastures when grazed by sheep and goats.

3.) Determine the milk production potential of goats stocked on grass-legume mixtures compared to alfalfa hay.

4.) Promote and facilitate the efficient adoption of forage-livestock systems and introduce concepts of sustainable agriculture.

### Approach

Efficient production of small ruminants is considered critical to the economic, social and political stability of the US Virgin Islands (USVI). Limited-resource small ruminant farmers depend directly on these livestock-based activities to generate income and provide food for their household.

Livestock farmers rely on a combination of grazing and confinement feeding in a cut and carry system, but the efficiency of this system is affected by seasonal deficiencies in quantity and quality of native pastures.

A lack of supporting on-farm research and development have limited economic growth and efficient ruminant production in the USVI. This project in the long-term will enhance the use of natural pasture resources by developing technologies such as controlled grazing, no-till overseeding of grasses and legumes, pasture regeneration with adapted forage species, and the rational exploitation of biological N<sub>2</sub> fixation (i.e., forage legumes).

During the first year of the project, pasture characterization of collaborators farms was undertaken. This survey focused on pasture conditions, fence lines and divisions, water resources, and size of flock. Pasture rehabilitation of two

farms has since been initiated.

Information will be extended through farmers town meetings, field tours, the active involvement of farmer cooperators and producers, and establishing linkages with other sustainable agriculture research sites.

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**SARE grant \$110,410**





## System for Conserving and Adding Value to Manure Sources of Nutrients in Turfgrass Sod

Manure and wastewater disposal on land holdings of large dairies has contributed to phosphorus accumulation on watersheds in the Southern U.S.A. A learning organization comprising dairy, turfgrass, and compost producers and university research and extension faculty was organized. The organization or 'learning system' is focusing on concerns about phosphorus loads on watersheds and the sustainability of both dairy and turfgrass industries in the Southern Region. The human activities of participants in the learning system are similar to a conceptual model of a system for enhancing the relevance of agricultural research to worldviews of diverse stakeholders.

### Objectives

Activities during the first 6 months of the project, including two project meetings, have been relevant to three project objectives:

- 1.) Organize the learning system,
- 2.) Characterize turfgrass responses and the fate of nitrogen and phosphorus after surface applications of manure,
- 3.) Evaluate the operational and economical feasibility of exporting manure sources of nutrients from farms and watersheds through sod.

### Approach

During project meetings, participants identified information and analyses that were needed to develop and evaluate a system for exporting manure sources of phosphorus through sod. Information about responses of turfgrass establishment, production, and quality after manure application is being developed in replicated plots. The production and quality of 'Tifway' bermudagrass and 'Prairie' buffalograss during the 15 months from planting to the first sod harvest was equal or better for manure compared to fertilizer sources of nutrients. Sod harvests of bermudagrass and buffalograss during summer, 1999 removed the phosphorus applied as manure before and 1 year after planting. The first sod harvest indicated surface accumulations of manure phosphorus can be effectively removed and exported through turfgrass sod. Manure influences on turfgrass regrowth after sod harvest and on recovery of the manure-grown sod after transplanting remain to be evaluated.

The fate of nitrogen and phosphorus after surface applications of manure and fertilizer is being evaluated on common bermudagrass plots. The volume and nutrient concentration in runoff from the 8%-slope of plots is being monitored after natural rainfall events. Metal barriers to runoff border the plots. Chutes and reservoirs on the down-slope end of plots channel and collect the runoff. Nitrogen and phosphorus losses in runoff are being compared between manure and fertilizer sources of nutrients. During a relatively large runoff event that occurred 3 days after equal phosphorus rates were applied as manure or fertilizer applications on the bermudagrass, the concentration of phosphorus in runoff from fertilized plots was 5.5 times greater than manured plots. Dissolved phosphorus concentrations in plot runoff were comparable between manure and fertilizer sources of phosphorus during the fourth rainfall event after either source of nutrients was applied to supply the same phosphorus rate to the plots. Manure sources of nutrients appeared to be less soluble and less vulnerable to loss in surface runoff than fertilizer sources soon after nutrients were applied to the bermudagrass sod. Potential losses of manure and fertilizer sources of nitrogen and phosphorus from the bare soil remaining after sod harvest and from transplanted sod remain to be quantified.

The information from plot-scale studies, field demonstrations on dairy fields, and the knowledge and experience of project participants will be used to develop recommendations for a union between dairy and sod production systems and to identify questions and knowledge gaps for future research and development efforts. In addition, project participants will use information from this and emerging projects to evaluate the operational and economic feasibility of exporting manure sources of nutrients through turfgrass sod. The export of manure sources of nutrients through sod is expected to contribute to the economic and environmental sustainability of both livestock and turfgrass industries.

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**SARE grant: \$16,854**



## Controlling Cheat and Annual Ryegrass in Small Grains Using Novel Crop Harvesting Technologies

Since McCormick first invented his reaper about 150 years ago, the age old drudgery of grain harvesting has slowly yielded to mechanization. After decades of gradual improvements, the grain binders and stationery threshing machines were finally joined together into machines known as "combined reaper-threshers" and later called combines. Over the past 75 years, the primary function of grain combines has remained the same—collect the grain crop and return everything else to the field. An advantage of the old grain binder plus stationery thresher harvesting system was that weed seeds were carried off the field with the bound shocks of grain. Our project goal was to regain this advantage by advancing grain harvesting technology to include separate collection of the seeds of weedy grasses, particularly cheat and Italian ryegrass, that now pass through a combine and return to the field.

### Objectives

1. Investigate three distinct modifications to conventional grain harvesting procedures designed to either remove cheat and annual ryegrass seed from the field during the wheat harvesting process or devitalize it.
2. Evaluate the new harvesting procedures as a component of an integrated cultural grassy weed control system.
3. Determine the economic feasibility.
4. Disseminate our findings.

A series of field experiments were conducted to evaluate the performance of harvesting equipment attachments whose functions was to retain weed seed as wheat was harvested, in contrast to discharging the weed seed back onto the field. A Redekop® chaff collector, purchased from the Canadian manufacturer, was a well designed machine wheat gave no mechanical problems. It did a very good job of collecting chaff and weed seed discharged over the cleaning sloe.

However, the collector choked the air flow from the combine separator causing excessive amounts of weed seed to be deposited in the clean grain bin. Subsequent research focused on readjusting the combine separator air fan flow, to deliberately collect the weed seed with the harvested wheat, and removing the weed seed with a field portable aspirator cleaner before the wheat seed was delivered to the grain buyer.

A Kice® aspirator and appropriate drives and

a grain holding tank were mounted on a tandem trailer and evaluated in on-farm tests. The aspirator was highly efficient and reduced dockage of cheat infected wheat from about 25% to less than 1%. Disadvantages to this approach were the cost of the field portable cleaning unit, and the extra labor and time required for conducting the in-field recleaning operation.

To overcome these problems of the field-portable aspirator cleaner system, an on-board aspirator cleaner was designed and installed on the Gleaner M2 combine. To overcome the requirement for separate storage of the weed seed removed by the on-board aspirator-cleaner, a hammer mill was designed, tested, and installed on the combine. Materials removed from the wheat grain flowed through the hammer mill, which effectively destroyed the weed seed, which was then returned to the field. The design also allowed collection of the aspirator material rather than passing it through the hammer mill, in order to inspect and quantify the materials removed from the wheat grain.

In Italian ryegrass infested wheat, reducing the air flow across the separator fan increased material removed by the on-board aspirator from 12 to 149 lb/a. However, the on-board aspirator was of inadequate capacity to effectively clean the wheat. In one experiment, recleaning the wheat cleaned by the on-board aspirator revealed that up to 108 lb/a of Italian ryegrass seed remained in the wheat.

At another site, the on-board aspirator removed up to 219 lb/A of materials from the grain before it entered the combine grain bin. However, another 308 lb/A of cheat seed remained in the wheat. Despite removing such large quantities of weed seed during the harvesting process, the weed seed content of the succeeding wheat crop was not affected by such removal. This was attributed to plasticity of the weed population which allowed a smaller number of weeds to produce the same amount of seed as a larger number would have. At one site, removing Italian ryegrass seed during harvesting did increase the yield of the succeeding crop 3 bushels/A indicating a very positive benefit of weed seed removal.

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**SARE grant \$208, 624**



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# State Professional Development Program Reports

Each of the following states received an allocation of \$10,000 to support training activities. Sustainable agriculture state coordinators from the 1890 and 1862 Land Grants submitted a collaborative training proposal, which was approved by the PDP Leadership Committee. These funds complement ongoing efforts in each state to provide sustainable agriculture professional development opportunities. The information presented below is not all inclusive; for more information on specific projects, contact the project director or PDP coordinator Roger Crickenberger (919) 515-3252.

## Alabama

SARE funds will be used to cover travel expenses of up to 8 people to the SARE Professional Development Workshop and the Southern Sustainable Agriculture Workers Group meeting in January 2000. Alabama participated in the SARE PDP Soils Train-the Trainer Workshop in Raleigh, North Carolina in September, 1999. Alabama participants included one county agent, two soil specialists, and one farmer. Mark Rumph, Alabama IPM and Sustainable Agriculture Program Assistant, attended the SARE Coordinator's planning meeting in Jackson, Mississippi, in October.

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## Arkansas

The University of Arkansas Cooperative Extensive System has been very successful in developing multi-agency and industry cooperation in natural resource management. Issues include nonpoint source pollution, watershed protection, reducing phosphorus loss from animal waste applied to pasture, reducing soil erosion and nutrient losses from row crops, and forestry and wildlife management. Cooperators include the Natural Resources Conservation Service, Arkansas Department of Environmental Quality, Arkansas Game and Fish Commission, Arkansas Soil and Water Conservation Commission, and Arkansas Livestock Industry. Focusing on cooperation helps ensure the implementation of natural resource management practices that protect the environment while maximizing production.

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We conducted focus groups with small farmers throughout the state to develop a strategic plan for small farm sustainable agriculture. Our new strategic plan focuses on marketing, network development, alternative crops and enterprises, and training for new farmers. We reorganized our sustainable agriculture advisory council as a result of this effort and collaboration developed under our Farmer to Farmer grant. Training for county faculty focused on organic production, alternative horticultural crops, caring for small flocks, consensus building and marketing. As a result of this training, county faculty have helped farmers develop new enterprises, such as organic citrus, aquaculture, and cut flowers. They have also assisted farmers in developing new direct markets for their products.

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## Georgia

To keep Georgia's sustainable agriculture professional trainers on the cutting edge, many training and delivery methods were employed. The Georgia PDP Web page (<http://www.bae.uga.edu/extension/sustag/index.html>) was completed and advertised throughout the state. In addition, three issues of the sustainable agriculture newsletter were completed and distributed. In 1999, more than 1,400 people attended at least one of 13 different events the Sustainable Agriculture Coordinators hosted. More than 350 agents received sustainable agriculture training through the annual extension winter school (a three day workshop on many topics) and our new agents foundation training program (a week long training activity). Most of these activities focused on land application of organic by-products which was ranked as a top priority at our last stakeholders strategic planning meeting. Activities in this area included field days and conservation tillage tours in Coffee County, Compost Facility Operators Training Workshop and a Compost Awareness field day in Athens, and cattleman's field days in Calhoun. An agent training on "Confined Animal Feeding Operations: Dealing with a Sensitive Community Issue" and two workshops for Small and Beginning Farmers were other highlights of the year.

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## Kentucky

The twin focus of Kentucky's PDP State Plan is to help create interdisciplinary research and training relative to Kentucky's major agriculture products and to help promote profitable farming systems that interact favorably with their communities and the environment, Kentucky's concept of sustainable agriculture. The Kentucky Agriculture Advancement Council, a leader group organized in 1997, helps to achieve this goal through council meetings at the county, area, and state levels. The Council meets twice yearly with 60+ leaders, Extension professionals, and administrators present. The "Third Thursday Thing", a series of Sustainable Agriculture Workshops conducted by Kentucky State University Extension with assistance from the University of Kentucky Extension helps to satisfy the other focus of Kentucky Sustainable Agriculture Program. Ten workshops were conducted with an additional Small Farm Field Day and Vegetable Tour and Auction. More than 1,000 farmers and community leaders attended some of these events.

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## Louisiana

We as a state are improving the working relations between working groups to increase our educational output and keep agents and farmers up-to-date with new techniques to modify or improve their programs. Education remains our number one program for sustainable agriculture. Water Quality, BMP's, Master Gardener, Digital Diagnostics, Marsh Maneuver, IPM, Aquaculture, Forages and Livestock, Wetland Management, Marketing and Composting are a few areas that are ongoing within our programs. Increased membership in LASAWG and the request for programs from agents and farmers provide us with a greater opportunity to educate the masses. One highlight of the past year was the formation of the Louisiana Sustainable Agriculture Working Group, LASAWG, which was formalized during summer, 1999. The organization is a broad based group including: LSU, SU, the University of Louisiana at Lafayette, farmers, and community based organizations including the Baton Rouge Economic and Agricultural Development Alliance (BREDA). LASAWG will disseminate information pertaining to sustainable agriculture throughout the state.

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## Mississippi

Twelve meetings across the state attended by 475 growers, provided information about the FACT Act definition of Sustainable Agriculture; additionally how the Mississippi Sustainable Agriculture State Committee is addressing the concept of sustainable agriculture. These growers were shown 28 production and conservation "best management practices" (BMP's) they could apply on their farms to aid sustainability. Many of the practices were discussed in monthly Extension newsletters and ag press print media articles. These practices were presented in an MSU Extension Service publication that was available to all county offices. Some 24 agents were participants in sustainable agriculture training. Data shows the use of minimum tillage coupled with better herbicide application timing which were two of the 28 BMP's, can result in a savings of \$8 - \$12 per acre. Assuming implementation on 25% of Mississippi corn and cotton acreage would amount to a savings of \$2.8 - \$4.2 million in production costs plus less pesticide applied to the environment, and reduced soil erosion.

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## North Carolina

Our sustainable agriculture interest group has come together to revise our strategic plan and has developed: mission and vision statements, plans for training AG professionals, sustainable AG curricula for the academic program, sustainable ag recognition programs, training opportunities for The Center for Environmental Farming Systems, participatory research, and outreach and publicity. Training activities were supported that included travel for agents and farmers to attend key workshops (PDP, Southern SAWG, CFSA Conference) NC rotational grazing schools, organic production systems.

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## Oklahoma

Development and delivery of a poultry waste management education program in Oklahoma began with sustainable agriculture training. Over 1,300 poultry producers attended with 1,128 certified having completed the 9-hour basics curriculum. Ten day-long training workshops dealing with the establishment of riparian areas and the benefits of modifying production practices to conserve riparian benefits were conducted. Three demonstrations showed how goats are used to control unwanted vegetation. A team is developing training based on the Southern SARE Soils Management Workshop. A farmer sent to the Southern SARE PDP Annual Workshop became a founding member of a new organic producers' organization.

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## Puerto Rico

Agricultural professionals (extension and research) and farmers have been involved in training activities, participated at meetings and workshops, and been involved in radio programs. Training activities have taken place at various locations on the island. Topics included: principles of sustainable agriculture, healthy soils, economics, practices for coffee production, soils and water conservation, dairy management, and community supported agriculture. Work continues on developing a sustainable agriculture strategic plan for the College of Agriculture Sciences. The state team that attended the SARE PDP soil management train-the-trainer workshop in Raleigh, North Carolina, is in the planning phase for soil training in Puerto Rico.

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## South Carolina

In 1999, Clemson University's continued development of the Sustainable Agriculture Production Systems Center demonstration site; two field days which attracted 550+ people; two field day reports with supplements; publication of 154 web pages on the Sustainable Agriculture Production Systems Center web site; development of an educational display used at Sunbelt Expo and the ANR Linkages Conference; and many group and producer tours of the Center. South Carolina State University's training efforts addressed the state strategic plan by collaborating with small farmers in conducting on-farm demonstrations. The participatory approach allowed the farmers to take ownership of the process and become actively involved in the concepts that were presented. During the past year, extension has focussed on presenting small farmers with information on alternative crops, expanding market opportunities, and strengthening marketing techniques.

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## Tennessee

Training was provided to over 2,800 Extension agents, producers, other federal and state agency personnel and others during 1998-99. Training continued to address high priorities as identified in the Tennessee Strategic Plan for Sustainable Agriculture adopted in 1995. Training focused primarily on five of the top ten most important needs relative to Extension's mission in sustainable agriculture. Using keywords, training focused on chemicals, forages, systems approach, (nutrient management) alternative marketing and value-added.

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## Texas

Although we are not holding training workshops specifically funded by SARE PDP grants, agents throughout the state in each district receive training on a variety of subject matter directly related to sustainable agriculture as defined by the legislation. We do not believe that specific training sessions for sustainable agriculture, when we are already providing training that includes sustainable agriculture philosophies, will enhance the effort already being made. Our effort in sustainable agriculture is to NOT make it a separate entity or program, but to include its philosophy as defined in the legislation into all our training programs. We want to promote and teach the use of BMP's for site specific problems for the increased productivity, environmental stewardship and sustainability of farming operations.

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## Virginia

Virginia accomplished a major reorganization of their SARE PDP in 1999. A new state SARE PDP Leadership Committee was formed and met three times. Both a new strategic plan and work plan for sustainable agriculture training for agricultural professionals were developed. Implementation of the plans has begun. In fiscal year 1999, two sustainable grazing conferences and one sustainable agriculture tour were held. In addition, three extension specialists, three agricultural extension agents and two vegetable producers attended the regional soil quality workshop held in Raleigh, North Carolina. As a result of that workshop, plans are underway to hold a soil quality workshop for extension agents in Virginia in the spring of 2000.

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## U.S. Virgin Islands

During the past year, the Sustainable Agriculture program in the U.S. Virgin Islands participated in many initiatives. These activities included in house professional development training, public seminars, and territory-wide conferences.

A much needed pasture management seminar was presented on both St. Thomas and St. Croix. Topics addressed included: pasture establishment, assessing and managing pastureland to protect water quality, and animal stocking rates and feed lot management. Presentations were delivered by University Extension and Research staff as well as by professionals from the V.I. Department of Agriculture.

On St. Thomas the Cooperative Extension Service (CES) in conjunction with the University's Small Business Development Center presented a seminar entitled Management and Record Keeping for Farmers. The twenty-one (21) participants who were predominantly livestock farmers were informed of the services and programs (including Sustainable Agr.) offered by our agency.

In another collaborative effort on St. Croix, CES staff delivered presentations as a part of a panel discussion on "The Potential for Developing a Tropical Fruit Industry" during which information on sustainable agriculture practices was disseminated. This discussion was a part of an annual activity which is organized to encourage the production, processing and marketing of tropical fruits in the Virgin Islands. A similar activity was staged on St. Thomas; collectively, more than 2500 participants benefited from a series of workshops and other activities.

During a third seminar on "Hurricane Preparedness" CES staff members shared information with St. Thomas and St. Croix farmers regarding preventative management practices to protect crops and livestock as well as to conserve soil and protect water quality during rain storms.

The 5<sup>th</sup> Annual Virgin Islands Nonpoint Source (NPS) Pollution Conference was held in St. Thomas, May 19-20, 1999. Extension staff along with two farmers made a presentation on the application of agricultural technologies to mitigate nonpoint source pollution.

On St. Croix CES Agriculture and Natural Resources staff in collaboration with the management of the St. George's Botanical Garden delivered a series of workshops on "Preparing Your Landscape for a Hurricane" and "Drip Irrigation Systems for the Virgin Islands."

During the 2<sup>nd</sup> International Conference on Herbal Medicine in the Caribbean, which was held on St. Croix in June of 1999, information was shared with farmers regarding appropriate cultural practices for herb production.

A joint effort between AES and CES staff resulted in the publication of a bulletin entitled *Growing Banana and Plantain in the Virgin Islands*. This publication will assist farmers in production management under Virgin Islands soil and climatic conditions.

Finally, Extension staff participated in Farm\*A\*Syst/Home\*A\*Syst staff training activity to prepare CES professionals to better assist clients in protecting the quality of water at home and on farms.

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## **Sustainable Small-Scale Agricultural Development Training Project**

### **Objectives**

The objectives of the project was for professional agricultural educators, community developers and organizational leaders and others with responsibilities for working with small-scale farmers to:

1. Become more aware of and understand the appropriate use of various small-scale sustainable agricultural models that are based on holistic approaches (production, management and marketing).

2. Acquire the necessary skills to work with grassroot groups, through the utilization of sustainable, holistic planning and management models that include leadership development, strategic planning and evaluation, and communicating and group-decision making.

The loss of small-scale family farms has increased significantly in the USA, and nowhere has the loss been felt more strongly than in the southern region. To reverse this trend, we must find ways to increase small farm profitability through sustainable agricultural approaches which are environmentally sound, holistic, regenerative, innovative, and practical for small-scale operations. A qualified cadre of professional agricultural workers who understand sustainable agricultural models, practices and concepts that can be adopted to make small-scale farming operations more sustainable could contribute greatly to the viability of these farms. The 1890 Extension System and several NGOs in the region have a cadre of such persons. Additionally, these institutions also include persons with a wealth of conventional agricultural experiences in research and outreach, which, if augmented by expertise in sustainable management practices, could enhance the viability of small farms in the southern region. A systematic and holistic approach is needed for small-scale farm sustainability. That need and opportunity is the basis for this project.

### **Approach**

The training program, jointly sponsored by Southern University Cooperative Extension Program and Heifer Project International (HPI), included two 2 1/2 days workshops. Participants were encouraged to attend both, although each workshop could be attended as a stand alone.

The first workshop (Phase I) was held

February 10-13, 1997 at the HPI International Livestock Center in Perryville, Arkansas. The workshop was attended by 48 participants, most of whom came from 10 southern states. Participants included county agents, community developers (NGOs), university researchers and extension specialists, USDA personnel and farmers. Phase I focused on leadership development, and strategic and holistic planning concepts suitable for small-scale agriculture. Participants engaged in a variety of activities including group development of a farm plan using a sustainable model. Actual participants' farms were used in this exercise, and each participant developed an individual work plan to be used when returning to work with the small farm clientele. The work plan included objectives, expected outcomes and time lines.

Phase I participants also attended a one day training session that also attracted 60 farmers, ranchers and agribusiness persons. General and breakout sessions were held featuring several models for sustainable farming operations including livestock, vegetable and integrated operations.

The second workshop (Phase II) was held on May 10-13, 1997 at Southern University and A&M College, Baton Rouge, LA. Over 80 individuals from 12 southern states and the Virgin Islands attended. Phase II focused on establishing successful small farm production and marketing strategies and practices for both sustainable livestock and cropping operations. Opening speakers helped to lay a conceptual framework of the program. These sessions stressed the importance of striving for sustainability in all life situations, and not just with agriculture. Other topics discussed included laws and regulations affecting alternative enterprises, including on farm slaughtering, organic certification, and farmers market establishment. Southern University's work with alternative commodities (vegetables, goats, rabbits, etc.) and sustainable soil and water management was also highlighted. Breakout sessions were held in which participants discussed their roles as educators in developing and improving sustainable agricultural practices on family farms.

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**SARE grant \$25,700**



The workshop concluded with a tour of the SU's horticultural farm and visits to four diverse small farm operations including an organic farm, a small fruit and winery operation, and HPI sponsored cattle raising cooperative, and a diversified small fruit, vegetable and mushroom farm. An optional visit to the Red Stick Farmers' Market was facilitated for those farmers who stayed an additional day.

## **Outcomes and Accomplishments**

### **Objective 1**

As a result of this project over 100 professional agricultural workers and community organizers were exposed to a variety of sustainable strategies and practices where holistic and systemic approaches were emphasized. Additionally, the inclusion of both nationally renowned speakers and local producers who discussed successful sustainable models helped to add credence to sustainable agricultural concepts. This was especially true for those professionals who had limited exposure to sustainable programs prior to these workshops.

### **Objective 2**

By attending the workshops, participants are better equipped to incorporate sustainable agricultural strategies and practices when working with their small farm clientele. Participants were provided with both theoretical and practical educational opportunities which have increased their effectiveness with the targeted clientele.

### **Dissemination of Outcomes**

Both professional agriculturists and farmers who attended have spread the word regarding the value of the workshop, and have encouraged others to attend similar workshops. Additionally slides and pictures from the workshop have been used in numerous subsequent presentations given by workshop sponsors and participants.

### **Impacts and Contributions**

As stated previously, workshop participants increased their appreciation of the importance of integrating sustainable agricultural production and marketing strategies when serving targeted small farmer clientele. Participants were encouraged to attend both 2 ½ day workshops, which allowed for more extensive consideration of both conceptual and practical approaches. The workshop also provided an excellent avenue for networking and provided informational sources for participants.

## **Trainee Adoption and Direct Impact**

Evaluative results of the workshops indicate that participants gained valuable knowledge regarding sustainable agriculture. Items that received the most favorable responses were hands-on approaches, sharing of success stories and farm tours. The item receiving the least positive response dealt with the sustainable conceptual framework.

The two workshops also laid the foundation for future programs and initiatives. Extension and research participants from Southern University, the co-sponsor, report an expanded small farm clientele, an increase in sustainable research and outreach thrusts and increased participation in farmers' markets. Growing interest in organic farming, pastured poultry and other alternatives has also been reported. There has also been greater attendance at the SARE Professional Development Program and Southern SAWG meetings by participants. These results can be attributed, in part, to the foundation laid by the two workshops.

Participants have also been instrumental in the success of similar programs designed for small and limited resource farmers both locally and regionally. The Agricultural Marketing Outreach Workshop which was held in Memphis Tennessee in March, 1997 and co-sponsored by USDA and Southern University attracted over 400 participants including 150 farmers from seven southern states. Many aspects of that conference dealt primarily with sustainable agricultural issues. Again, not only did many of the farmers and agricultural professionals who attended our PDP training workshops attend, but they were instrumental in identifying farmers who could benefit from the program. Several participants also served as presenters.

The Sustainable Small-Scale Agricultural Development Training Project also helped to strengthen the collaboration between participating partners. Subsequent to the PDP project, Southern University and HPI have collaborated on several projects including a integrated pastured poultry and vegetable project (funded by SARE in 1999) and a marketing and management workshop which was held in Baton Rouge, LA in October, 1999, and was attended by over 80 farmers and professional agriculturists.

In short, the PDP training workshops were a part of a continuing and cumulative initiative to increase small farm sustainability in the South.

## **Feedback from Farmers and Ranchers**

Producers played an integral role in all aspects of the project, including planning, presentations and farm tours. The fact that successful sustainable operations were featured added greatly to the program's impact. For example, prior to the workshop, several participants had never visited an organic farm. Participating farmers were very receptive to the on-farm tours, and presentations by other farmers. Several farmer participants and presenters have increased their efforts to get other farmers in their areas involved in sustainable programs. Several of these farmers were quite instrumental in getting farmers throughout the south to attend the SARE sponsored Sustainable Agricultural Production and Marketing Practices for Limited Resource Farmers Conference held in Baton Rouge in June, 1999. That workshop, hosted by Southern University, attracted over 50 farmers and agricultural professionals from seven southern states.

### **Future Recommendations**

There continues to be a level of resistance to the adoption of sustainable agricultural practices in the south by both professionals and farmers. Part of the reason for this is that many farmers and agricultural professionals have often not been exposed to successful models. Projects such as this one are necessary to overcome this resistance by providing such models.

The June, 1999 conference sponsored by SARE designed for limited resource farmers that was previously discussed was also a good step in the right direction. It was well attended by farmers, many of whom had not attended similar meetings. Perhaps this could be held annually and in different southern states.

A possible strategy for the future could be a two-part workshop, with professional agriculturists and farmer/teachers attending the first workshop. This would be followed by a workshop for the farmers in which participants from the first workshop would organize and facilitate the second.



## Southern Gathering on Agricultural Problem Solving

### Objectives

1.) Involve extension professionals, other farm service institutions, public media and farm families in the collaborative development and delivery of curricula on issues deliberation, strategic planning and conflict management.

2.) Foster collaboration between educational institutions, extension educators and extension clientele in delivering materials and concepts to workshop participants;

3.) Cooperate with Kentucky Leadership for Agricultural and Environmental sustainability Project, the University of Kentucky Agriculture 2000 and the National Issues Forum initiative of the Kettering Foundation to achieve synergism between development programs.

4.) Cooperate with partners in publicity of project activities.

5.) Solicit balanced participation by diverse farm community sectors, with attention to gender, race, farm related income, disability and other relevant demographic characteristics.

6.) Develop participant ability to apply methods of problem-solving to agricultural and broader rural community issues.

7.) Include hands-on learning activities in curriculum development (i.e., role playing, simulations, and creation of action plans to be implemented in home communities of participants).

8.) Bring the capacity of agricultural and rural leaders to bring about change through the application of workshop knowledge and skills.

9.) Evaluate workshop efforts focusing on changes in knowledge, opinions, skills and aspirations. Include a wide range of people in the evaluation of the project.

### Approach

The project was inspired by growing contention in the South's rural areas about issues associated with agriculture, the environment and development. Citizens are often pitted against one another over the definition and resolution of public problems such as balancing individual property rights with the interest in planning and zoning or the interest in expanding agricultural production while others are concerned about the impact on water quality or the quality of life because of intensified hog or poultry operations. The project designers felt there was a need for more constructive and healthy dialogue between

neighbors, the sharing of resources and the need to find common ground amidst conflicting values and interests about public issues. However, many capable rural and agricultural leaders do not have the skills, knowledge or behavior to address these difficult public problems in a way that can sustain relationships. Out of this scenario, the Southern Gatherings for Agricultural Problem-Solving was born. The planning has involved collaboration from a wide variety of groups including the Community Farm Alliance, the Cooperative Extension Service, the Kettering Foundation and the Center for Sustainable Communities. They were drawn together by the projects' objectives and were primarily interested in empowering agricultural and rural community leaders with process skills, knowledge and behavior to deal with contentious and difficult public issues.

There was significant planning and curriculum development to prepare for the Gatherings.

Three learning tracks were designed: strategic planning; alternative dispute resolution and deliberation. The strategic planning aspect focused on how to create a collective vision for a community's future and how to implement that vision. The alternative dispute resolution curriculum contained practical applications for moving towards common ground and "solutions everyone could live with." There were several plenary talks that were supposed to complement each of the three tracks.

### Results

The first Southern Gathering took place on October 9-11, 1996 with 125 participants. The November 5-7, 1997 Gathering involved 54 participants. There wasn't a gathering in 1998, but there was a spinoff from the Gatherings and over a hundred people were trained in conflict resolution in 1998.. Many were rural elected officials as well as agricultural leaders.

The 1999 Gathering had 31 participants. It focused exclusively on deliberation. Deliberation involves thinking about the choices associated with a difficult public problem rather than whose side one is on. Usually, there are three or four public policy choices involved. When citizens look at the strengths of each

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**SARE grant \$52,000**



choice and when they walk in the shoes of advocates or critics for each choice they are moving towards deliberation. The 1999 Gathering was oriented towards rural elected officials. This group was targeted because relatively little effort had made in the past to involve them and project coordinators believed their presence was crucial for strengthening the region's civic infrastructure. It was decided to focus on deliberation because initial project work on public conflict resolution and strategic planning is being integrated into mainstream Extension work and is finding a receptive home in organizations such as the Kentucky League of Cities. Deliberation, on the other hand, seems more elusive and difficult to teach or learn and so, that is why the project organizers decided to focus on it during the third year of the grant.

As the project matured, the organizers moved towards investing in the development of local trainers and relying less on external expertise. For example, at least four Extension agents have been trained as mediators and have practiced their skills in order to strengthen the vibrancy of their conflict resolution teaching. Other Extension agents have taken part in National Public Policy Institutes and have trained as National Issues Forums faculty members to better understand the art and science of deliberation. They have also involved the public through National Issues Forums, a deliberative approach developed by the Kettering Foundation. This investment in building our own regional expertise is paying off in terms of sustainability. Their skills, knowledge and insights have matured sufficiently to the point that they want to teach. They want to strengthen the region's civic life and the capability of citizens to deal with divisive public issues. Consequently, they are involved in planning the October 5-6, 2000 Gathering on deliberation.

The project is building new partners such as the Kentucky Center for Public Issues, the Kentucky Association of Counties and other entities such as public libraries. The 1999 Gathering received top-notch evaluations about the content and teaching of deliberation. Elected officials have indicated they want to be partners in planning the next Gathering and in the exploration of how to strengthen civic life in the region.

During the summer of 1999 an external evaluator, Dr. Melanie Doebler, met with project participants as part of a two and three year follow-up study to better understand the impact of the project. She conducted a focus group as well as individual interviews with eighteen participants.





## Farmer to Farmer Networks: An Experimental Approach

### Objectives

The overall objective of the project is to explore alternative approaches that Extension can use to facilitate the development of farmer networks, particularly for small and/or part-time farmers. The specific objectives are to (1) Provide Extension agents and other agricultural professionals with the skills, knowledge and experience needed to serve as successful catalysts for the development of farmer-to-farmer interchange, (2) implement different approaches to farmer-to-farmer interchange in North and Central Florida, (3) evaluate the effectiveness of the approaches that are used, using participatory process evaluation strategies and (4) share results with Extension agents, farmers, and other agricultural professionals throughout the Southern region.

### Impacts

**Small Farm Organizations.** As a result of the Farmer-to-Farmer project and local Extension focus on small farm sustainable agriculture, several small farm groups have formed around the state. Some are commodity focused and others have a geographical focus. Most of these groups conduct quarterly or monthly educational programs that are planned by the group in conjunction with one or more local Extension faculty members. Some also conduct yearly conferences and most publish a newsletter.

**Statewide Organization.** One of our original objectives was to develop a statewide umbrella organization of the various small farm groups. This was not realistic. Our leadership layer in the individual groups is too thin to permit the development of a statewide organization. When we saw that a statewide organization would not work, we looked for other ways to bring larger groups together to create more effective farmer and farmer-Extension networks. Mr. Wayne Odegard came up with the idea of larger regional annual educational events that would be co-organized and sponsored by the various individual groups and the regional county faculty leadership teams. These have proven very successful. We conducted the first of these in 1998 in Brooksville. Farmers, county faculty, non-for-profit organizations, and private businesses all conducted workshops and demonstrations.

About 400 farmers attended, and this increased to about 1,200 in 1999. In 2000, we are launching a new regional Small Farm Day in Deland, Florida (east central Florida).

**Launching New Local Groups — the Catalyst.** In northwest, south and east, central Florida, we are using the regional events to help us launch local small farm organizations. While the regional Small Farm Day in Brooksville grew out of the local small farm organizations, we believe that we can use the events themselves to help small farmers organize.

**Strengthened Institutional Collaboration.** As a result of this project, collaboration between Florida A&M University and the University of Florida with several not-for-profit organizations was also enhanced. Specifically these include the Natural Resources Conservation Service, Florida Organic Growers, Heifer Project International, Florida Farm Bureau and the Hillsborough County Economic Development Council.

### Dissemination of Outcomes

The document, "Lessons Learned," described in the original proposal, will be sent to state sustainable agriculture coordinators throughout the Southern region. In addition, we are in the process of establishing a small farm sustainable agriculture electronic bulleting board and discussion group, primarily oriented toward state and county faculty, collaborating institutions such as Heifer Project International and Florida Organic Growers, and farmers in Florida, but also open to membership by others who wish to share their experiences and information.

### Potential Benefits and Impacts

**Change in Approach.** Perhaps most important, our approach to meeting small farmers' needs has changed. The county and state faculty involved in Farmer-to-Farmer are much more oriented toward a grass roots approach. They involve farmers more as collaborators and colleagues in the educational process.

**Expanded Emphasis on Small Farms in Extension.** The Farmer-to-Farmer project, as well as our State Training Plan support from

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**SARE grant      \$80,997**

SARE, has resulted in greatly increased emphasis on small farm sustainable agriculture in Extension. For the first time in many years, we have hired some county faculty members whose specific mandate is small farm sustainable agriculture.

*Expanded Regional Faculty Groups.* One of our objectives with this project was to develop regional "core faculty" groups, groups of three to six county faculty members who would pool their expertise to provide regional leadership for small farm sustainable agriculture programming. We now have three core groups.

*Expanded Interest at Research and Education Centers.* We are building interest at our regional Research and Education Centers. Most importantly for expansion of our small farm sustainable agriculture program, we now have small groups of state faculty at the North Florida REC (Quincy, northwest Florida) and the Southwest Florida REC (near the Everglades) who are becoming involved in developing small farm sustainable agriculture programs.

*Trainee Adoption and Direct Impact*

The number of counties where local faculty conduct programs in sustainable agriculture oriented toward small and part-time farmers has increased and the variety and number of programs they conduct has expanded and changed in emphasis. In 1998, for example, county faculty reported the following achievements under Florida's Small Farm Sustainable Agriculture state Extension program. While not all of these are a direct "spin-off" from the Farmer-to-Farmer project, they do show the extent of interest that now exists in our system.

- County faculty conducted 28 demonstrations and/or field days attended by over 1,000 individuals.
- They conducted 117 educational programs attended by over 5,000 participants.
- They held 18 educational programs attended by nearly 1,000 farmers.
- Nearly 150 newsletters were published, distributed to approximately 3,700 individuals.
- 116 mass media educational efforts reached nearly 1,000,000 Florida citizens.
- Over 50 local educational written materials other than newsletters were produced, going to about 7,500 readers.

They organized (with farmer collaboration) and conducted the first Brooksville Small Farm Day attended by nearly 400 farm families in 1998; the second Small Farm Day in 1999 was attended by 1,200 small farmers.

Furthermore, our visibility and credibility in Extension has increased. The state and county faculty involved in Farmer-to-Farmer won a statewide team Extension programming award in 1999, which attracted considerable attention and interest on the part of both state and county faculty. Our Brooksville Small Farm Day was one of only a few Extension efforts highlighted in the 1999 issue of *Impact* magazine devoted to Extension, the University of Florida's publication that informs the public of our achievements. The number of state specialists involved in small farm sustainable agriculture programming has expanded, as have the disciplines they represent and their geographic location in the state. For the first time, we are reaching into south Florida and northwest Florida.

*Feedback from Farmers and Ranchers*

We used a participatory evaluation technique to assess the impact of our project. The approach used, called triangulation, involves asking people with different perspectives (in our case state faculty, county faculty and farmer leaders) the same or very similar questions. The objective is to determine the degree to which the different groups share a common perspective on the value of the joint activities and programs in which they participated. We have summarized the most important items from this approach in the attached document, "Lessons Learned."

*New Hypotheses and Future Recommendations.* (1) Focus one of our annual PDP meetings on facilitating farmer organizational development so that people from all over the Southern region can share experiences and interests. (2) See if Southern SARE can find funds for and an institution that would be willing to host a regional small farm sustainable agriculture conference. This could complement the National Small Farm Conference nicely since that conference is not a yearly event. It would permit small scale producers and Extension professionals throughout the region to come together and focus on issues of specific

concern to the region (such as alternatives to tobacco farming, etc.). The Small Farm Conference sponsored by "Small Farm Today" each year is a good model. This should be a self-financing event. (3) We desperately need help meeting the needs of new or inexperienced farmers both nationwide and in the region. Perhaps SARE could play a catalyst role in this by forming a committee of state and county faculty, not-for-profits, and farmer organizations around the region to develop some educational materials (one major need), hopefully that individual institutions in the region would support financially. For example, the University of Florida is trying to put together a series of fact sheets on "Matching Your Resources to Enterprise Requirements." If other states are doing other things we could share our materials and reduce the demand on any one state.





## Kentucky Cooperative Extension System Training Project

### Objectives

1. To educate 1862 and 1890 extension professionals and paraprofessionals about sustainable agriculture.

2.) To educate 1862 and 1890 extension professionals and paraprofessionals about practical uses of organic agriculture.

3.) To educate farmer leaders (members of the Kentucky Agricultural Advancement Council and Area Agricultural Advancement Councils), NRCS and agency employees and farmers about sustainable agriculture and organic agriculture and the need for leaders to share this information throughout their local communities.

### Approach

The Kentucky Cooperative Extension System Training Project has successfully developed multidisciplinary teams of farmers, 1890 and 1862 Extension and Research professionals and paraprofessionals, NRCS and other USDA agency professionals and technicians, Kentucky Department of Agriculture and other state agency staff, state and private universities and colleges, Heifer Project, Intl., agribusinessmen, consumer advocates and veterinarians to address sustainable agriculture issues in Kentucky. Nearly 85 people regularly attend the monthly mini-field day training sessions with over 600 attending throughout the year. Many participants regularly commute for three to four hours to attend, many adjust work schedules and provide shared learning experiences. Enthusiasm is high as participants look forward to the next Third Thursday. Topics covered have included many subjects and subject areas. Marketing and economics topics have included direct marketing, livestock and grain marketing, farm planning and farm records, certified kitchens, alternative marketing methods, advertising, consumer marketing, USDA programs including FSA, RD, Crop Insurance, and NRCS, and consumer awareness issues. Organic, alternative, and traditional methods of sustainable production of grain, tobacco, vegetables, fruits and nuts, livestock, poultry, aquaculture, bees, ostriches and alternative animals, pawpaws, forages, herbs and beneficial insects have been studied. Production issues have included water quality, cover crops, soil quality and tilth, and environmentally friendly agricultural production. Socio-economic issues have included the needs

of small, minority and/or limited-resource farmers, as well as the social and economic needs of farm families and family farm sustainability in a local, regional and global economy. The natural progression of the KSU Research Farm has provided an excellent site for the hands-on training.

Over 450 people from four states and over 50 Kentucky counties attended the statewide Small Farm Field Day held on September 16, 1999, the second statewide field day sponsored through this project and hosted by Kentucky State University Land Grant Program. It was held in conjunction with the proclamation of Kentucky Farm Safety Awareness Week and its associated activities at the request of the Kentucky Commissioner of Agriculture. Nearly 50 sustainable agriculture topics were presented with five tracks focusing on aquaculture, livestock, fruits and vegetables, water quality and crops, and farm safety, health and nutrition. The field day showed strong multidisciplinary commitment between Kentucky's 1890 and 1862 research and Extension efforts, farmers, agribusinessmen, SARE, USDA and state agencies, Langston University, Berea College, the MANNRS student organization, and consumer groups. The Governor of Kentucky along with the Kentucky Commissioner of Agriculture proclaimed Kentucky Farm Safety Awareness Week prior to their staff conducting a mock rescue training program.

One of the notable monthly workshops was the Second Annual PawPaw Workshop. Held in cooperation with the National PawPaw Foundation, the workshop had nearly 200 participants from 12 states and several Kentucky counties. Numerous Family and Consumer Science as well as Agriculture and Natural Resources agents attended, plus specialists and researchers from Florida and Virginia to Iowa and California attended. Several current pawpaw producers indicated that they benefitted from the training, at least five producers are planning to add pawpaws as an alternative crop.

The sustainable agriculture training is already showing impacts across Kentucky. Those impacts will be detailed in the final report at the end of project activities.

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**SARE grant \$50,000**





## Developing Trained Professionals and Teaching Aids to Support Educational Programs Addressing Management of Stored Grain

### Objectives

1) Conduct a train-the-trainer seminar whereby county extension agents and key farm leaders will receive current information on the management of stored grains. Training will emphasize an IPM approach that minimizes insect damage, mycotoxin levels and pesticide residues thereby maintaining the highest possible grain quality and profitability for the grower.

2) Conduct a demonstration of post-harvest management systems that will begin in the fall of 1997 and be available for observation and training purposes at the seminar to be held in the spring of 1998.

3) Improve the quality of educational materials available to county agents and farmers by a) producing an instructional video tape emphasizing management techniques discussed at the seminar, and b) publishing a proceedings of the seminar which will include results of the demonstration as well as other pertinent information which could be used for training purposes.

Our original proposal has now been expanded to include the following objective:

4) To conduct a series of six on-farm grain fumigation workshops in Georgia and Alabama. These workshops are designed to increase applicator awareness of safety issues and improve the efficacy of grain fumigation and thereby the quality of grains stored on the farm.

The goal of this project is to improve the knowledge base of county extension agents and farm leaders regarding management techniques for maintaining post-harvest quality of grains stored in southeastern states. Training will include consideration of the unique insect and mycotoxin problems associated with high temperature and high humidity conditions during storage and emphasize a systematic management approach.

### Approach

The University of Georgia Cooperative Extension Service along with the Alabama Cooperative Extension Service will work together to conduct a train-the-trainer seminar at the Coastal Plain Experiment Station in Tifton, Georgia on March 25, 1998. The 1890 land grant universities, Fort Valley State and Alabama A&M will

be invited to participate along with representatives of key organizations such as the Georgia Corn Commission, the Alabama Feed Grains Commission and the Georgia Corn Growers Association.

The project will address the increased insect and mycotoxin problems associated with grain stored in southeastern states. One of unique problems that will be addressed is field infestation of corn by the maize weevil, the key pest of stored corn in the south.

### Results

As of this report, the original objectives of this project have been completed. The training seminar was conducted on March 25, 1998. Thirty trainees attended the seminar and rated it a 9.4 on a scale of 1 to 10 with 10 representing the best training they had ever experienced. Classroom as well as "hands-on" training sessions were conducted as planned. The 8-month storage demonstration was conducted and the results were available for viewing at the seminar. Participants saw the results of four different storage scenarios and learned that grain quality and value increased as management inputs increased. Production of the instructional video tape has been completed and copies have been distributed to program participants, industry leaders and selected university faculty in southern states.

As of this report, the first fumigation workshop has been completed (Walker County, Ga. 11/03/99) and five others are scheduled for the month of November. County agents from Georgia and Alabama have been invited to attend and bring a key farmer from their county.

We hope that by communicating the results of this project to people that serve as key sources of information, the project will eventually impact all grain producers and grain handlers in the southeast and improve the quality of our grain and the profitability of grain production. Increased grain production in the southeast will improve crop rotations and increase utilization of minimum tillage systems.

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SARE grant \$38,150



## Overcoming Training Obstacles: A Realistic Cost-Effective Approach

Focusing on long-term sustainability of farms and rural communities in South Carolina, as reflected in the South Carolina Strategic Plan, and the Southern Region SARE Program, there is but a single objective of the State Training Enhancement Project as submitted in this proposal: Sixty (60) agents, will be trained to overcome identified obstacles that would impede the effectiveness of training outlined in the Strategic Plan.

Predominant is the implementation of a cost-effective and realistic approach to the elimination of obstacles that would result in a definitive improvement of training.

In South Carolina, identified obstacles would include, but not be limited to the insufficiency of:

- delivery of information
- technical support by professionals extant to the institution
- on-site demonstrations
- cross-education between large and small scale farmers
- marketing of training programs to potential participants
- comparative data developed to reflect cost-benefit analysis of conventional versus alternative farming

Paramount to the survival of limited-resource-small scale farmers, is the reduction of their risk of vulnerability to continuing changes taking place in agriculture. Such changes have been technological, financial and demographic.

Overcoming obstacles to such training, in a manner that is realistic and cost-effective provides the greatest enhancement to sustainability and attainment of goals as delineated in the South Carolina State Training Program.

Farmers must be empowered with essential "management tools" for continued survival. This is particularly true for limited resource small scale farmers. Changes in agriculture have made their survival more vulnerable. Such changes have been technological, financial and demographic. The sense of urgency to empower limited resource small scale farmers with these essential "tools" is of the utmost importance. The most cost-effective means to accomplish the task is through collaborative training of farm agents and similar professionals; appropriate organizations; governmental agencies; and farmers themselves.

We are trying to overcome these obstacles by working towards the improvement of:

- agents to fully embrace unconventional agricultural practices
- state and county level support for extension administrators
- coordination of educational programs and activities with other organizations and agencies

A resource directory of supporting agencies and non-governmental organizations has been produced for farmers as a reference tool. We will continue to make plans to arrange workshops for agents and farmers to discuss issues and to provide information on cooperatives which can be used effectively to help limited resource farmers market their products.

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**SARE grant     \$10,000**





## The First Requirement of Agricultural Sustainability: Efficient Management of Available Resources

Previous training by the South Carolina Cooperative Extension Service focused its efforts on the training of agents in the precepts of sustainable agricultural production and integrated pest management practices that would eventually result in the reduction of off-farm inputs by practicing farmers. This proposal will meet the needs of limited resource farmers by training the trainer(s) to become more effective agent(s) in the transfer of knowledge of management strategies and effective utilization of agriculture policy to create a more sustainable agriculture.

Sixty (60) agricultural agents participating in a South Carolina Train-the-Trainer mini-course/workshop will acquire knowledge and develop skills to:

- Help farmers define specific objectives and develop short and long term strategies for a profitable and sustainable agriculture.
- Identify practical and accessible information resources and recommendation for sustainable agriculture practices.
- Design and test appropriate integrated management strategies that will efficiently utilize available resources, reduce off farm inputs and generate a profit.
- Increase capacity to analyze and critique integrated systems research, improve their decision making and teaching skills involving complex relationships within/ among biological, financial and/or social systems.
- To identify management problems and recommend integrated management strategies of whole farm systems that will generate a profit and perpetuate ownership of family farms.
- Build greater institutional support for sustainable agriculture training both within and outside the land grant institution.

Limited resource small scale farms, the type most frequently operated by African and Native Americans are susceptible to the overall changes that have taken place in agriculture. There has been and continues to be a significant and disproportionate decrease of Black and Native American farmers; and a disproportionate amount of land lost by these groups. They do not have sufficient knowledge about management strategies that are influenced by tax laws, terms of credit, agricultural farm policy, types of farm

business ownership, inheritance transfer mechanisms, and the legal instruments for maintaining or acquiring land. The emphasis of the first requirement of sustainability for limited resource farmers is to help them become more effective managers of limited resources, both renewable and non-renewable.

The majority of agricultural agents have limited or no experience in the management of diverse alternative farming systems. Because of this and other societal reasons, there are serious doubts and frequently a bias against alternative systems that require enhanced management skills. However, these strategies possess a level of understanding that greatly exceeds that of those strategies used in the current conventional system.

The plight of the limited resource farmer is so unique and severe that any attempt to improve management skills requires specific research initiatives and educational programs targeting management problems and agricultural policy. The attention given to agricultural management is extremely focused toward a large corporate commercial conventional agriculture system, accessible to those with resources above those of the limited resource farm family. Emphasis has been placed on limited resource farmers to make them highly productive, efficient and environmental managers as a result of more relevant training of agricultural agents to efficiently and effectively address managerial problems of farm systems.

We are finalizing courses for a training session to cover the following areas:

- applying economic principles
- diagnosing farm business problems
- inventory of farm resources
- using enterprise budgets
- whole farm and ranch planning
- business organization and resource management
- capital use and credit planning
- land acquisition and use strategies
- agriculture farm policy
- organizing and managing cooperatives

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## Nuisances in the Community: Training on the Issues and the Methods of Mediation

### Objectives

The objectives of the "Nuisances in the Community" video project include examination and analysis of the following areas:

- 1.) Nuisance laws in the Southern Region
- 2.) Right-to-Farm laws in the Southern Region
- 3.) Anti-corporate farming laws in the Southern Region states
- 4.) Odor regulations in the Southern Region
- 5.) Environmental regulations controlling live stock operations in the Southern Region
- 6.) Examples of community confrontations occurring in the Southern Region around the expansion in size of agricultural operations, particularly livestock operations
- 7.) Principles of alternative dispute resolution, generally, and mediation laws in place in the Southern Region specifically;
- 8.) Examples of successful mediation techniques and discussion of how mediation principles can be effective in resolving community disputes
- 9.) How the principles of sustainable agriculture can be used to address community concerns associated with nuisance problems and agricultural operations.

The aim of the project is to provide a visual tool with accompanying written materials which discuss the complexity of legal issues surrounding these operations. We are hopeful that the project will provide yet another tool with which knowledge of the complex policy issues surrounding these operations can be transmitted. The project is designed to reach all types of interest groups, particularly those involved in extension and land-grant activities, but not to the exclusion of other agricultural players, rural citizens, and those from other constituencies important to agriculture.

Progress during the past year on this project has been slow-paced. Video footage shot in previous reporting periods has undergone the painstaking process of examination and re-examination in order to cull unwanted footage and compress the hours of video already shot into a manageable and productive final piece. This process of editing is slow and somewhat tedious, requiring many hours of piecemeal work. In order to bring the project in within the budget parameters, decisions were made concerning the proper role of the project coordinator vis-à-vis technical video personnel.

Although the coordinator's primary responsibilities during the course of most of the reporting period included managing the day-to-day operations of the National Center for Agricultural Law Research and Information, work on the project was sandwiched in to continue the editing work begun in previous cycles under this grant. Changes in project scripts and focus were folded into this year's work in order to accommodate recent decisions of the courts on the issues of right-to-farm and to accommodate recent actions by legislative bodies within the Southern region on the issues. As the law does not normally stand still, nor does this project. In order to make the final product the most relevant tool possible, changes in orientation of script and video presentation must be made as we go. The technical aspects of this project are most prevalent in this final year of production.

The written materials designed to accompany the project have also undergone revision due to exigent circumstances arising during the course of the project. Finally, the principal investigator has recently left the employ of the National Center for Agricultural Law Research and Information, taking a position as vice president for the Kerr Center for Sustainable Agriculture. We anticipate this move will allow the expeditious completion of the project in the next few months.

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**SARE grant \$ 56,000**



## State Training in Integrated Erosion Control Systems

### Objectives

Improve producer involvement in Sustainable Agriculture Training in Oklahoma consistent with the State Strategic Plan.

1.) Improve curriculum development related to erosion control in Oklahoma to strengthen the State Strategic Plan.

2.) Effectively train 120 professionals in Oklahoma in erosion control.

3.) Development new integrated curriculum that could be used effectively in other training events with emphasis on distance learning methods.

4.) Build institutional support form a wide filed of agencies and organizations for Sustainable Agriculture Training in Oklahoma.

### Approach

The project was designed in 2 phases:

Steering committee for these projects, noted in the previous report, convened for a second time (February 26, 1998) to begin planning for sustainable agriculture erosion management workshops. It developed the overall strategy for the workshops, general topics and discussed location and speakers. At this point two working groups were established to form the committees to complete planning and conduct the workshops.

The Oklahoma Cooperative Extension Service conducted two training programs on Erosion Management and Riparian Protection during the reporting period. Planning committees consisting of representatives from several agencies, university personnel and farmers were formed to develop the agendas. The training encompassed the basic science and technology of wind and water erosion. The value and use of water control structures, vegetative plantings, crop residue management of riparian areas was also discussed. The training for the west occurred on September 22-23, 1998 at Weatherford, Oklahoma. The eastern session was held on October 1, 1998 at the Kerr Center for Sustainable Agriculture, Inc.

The training was targeted for county Extension Educators, NRCS and FSA agency personnel, land managers/environmental educators with American Indian Tribes, State agency personnel, non-profit organizations, and others involved in conservation and environmental work. A list of the attendees for each training session is attached. The training included individual presentations, panel discussions and work sessions. Demonstrations and a

field trip helped to reinforce the classroom activities. A 3-ring binder was provided to each attendee as an office reference guide.

There were 66 individuals in attendance for the two days of training conducted on September 22-23, not including the presenters. An evaluation of the training was conducted. Attendees were asked to rate various parts of the training and to estimate the value of the information in their job. Most felt that the training was worthwhile and would be valuable to them in their day-to-day operations.

Thirty-three individuals, in addition to the trainers, attended the workshop/tour conducted on October 1. An evaluation was conducted at the end of the training. Some key points learned included BMP's uses of trees and forestation in erosion control, and value and potential application of riparian areas.

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## State Training Enhancement Project to Ensure Effective Sustainable Agriculture Training in Integrated Erosion Control Systems

### Objectives

Improve producer involvement in Sustainable Agriculture Training in Oklahoma consistent with the State Strategic Plan.

1.) Improve curriculum development related to erosion control in Oklahoma to strengthen the State Strategic Plan.

2.) Effectively train 120 professionals in Oklahoma in erosion control.

3.) Development new integrated curriculum that could be used effectively in other training events with emphasis on distance learning methods.

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**SARE grant \$10,000**



## **Building Capacity in Sustainable Agriculture: A Comprehensive Training Program in Organic Farming Systems**

### **Objectives**

1.) Conduct a series of workshops for extension specialists, agents, mentor farmers, consultants, NRCS employees, and other teaching professionals, emphasizing how the major components of organic production systems can be incorporated into a productive management system. A major focus of each workshop will be the integration of the various crop production factors into a working system. Graduate credit through NCSU will be offered to those agents who participate in the entire series.

2.) Set up demonstrations at The Center for Environmental Farming Systems (organic unit), and on farms, to provide hands-on experiential learning opportunities in conjunction with each of the workshops.

3.) Integrate organic producers into the training by including tours of various farms, and including farmers with specific expertise as facilitators and trainers at the workshops. A tour to Rodale Institute has already been proposed for 1998 as an advanced training for ag agents, and will be integrated into this program.

4.) Develop a training manual which will include chapters from each of the workshops. The edited training manual will be made available to other States in the southern region.

5.) Establish a farmer-to-farmer mentorship program to utilize successful organic growers in training other prospective growers. Agents will also be encouraged to actively recruit interested farmers to participate in the mentorship program. The mentor farmers will be available to advise and offer support for the 'apprentice' farmers. Mentor farmers will also be invited to attend the workshops to allow them to strengthen their expertise in various areas.

6.) Existing programs providing training on organic production will be incorporated into this program, in part, by providing funds for agents to attend these activities. These include the annual CFSA conference, annual organic vegetable schools in the western part of the state and in the piedmont, and farm tours in central, eastern, and western North Carolina.

### **Approach**

Training of agents and other ag educators took place between April, 1998 and November 1998.

Six, two-day workshops were conducted, and a wrap-up meeting was held at the annual extension conference in November. Approximately 52 NC agents attended at least one session, in addition to 12 participants from Florida and 6 from Virginia. Approximately 40 agents came to all the sessions, and completed all assignments, and 32 of those enrolled for graduate credit.

Each workshop covered areas critical to organic production, and included organic fertility management, composting, cover cropping, impacts of crop rotation, designing whole farm systems, soil biology/ecology/quality, delivery systems for disseminating information to organic producers, organic insect, weed, and disease management, tillage systems, organic greenhouse management, integrating animals into organic production systems, and involving farmers in sustainable agriculture.

Each workshop had hands-on field demonstrations as an integral part, and most incorporated field trips and farm tours. Some examples of the field demonstrations are: planting crops at weekly intervals and observing differences in weed populations; planting strips of various winter and summer cover crops and rating them for biomass production; utilizing soil quality kits, etc.

A key component to the workshops were the integrated and interdisciplinary approach to teaching about organic production systems. Even though each workshop had a specific topic as a focus (eg., organic fertility management), facilitators were expected to integrate other disciplines into the workshop. The Carolina Farm Stewardship Association's Sustainable Agriculture Conference was recently held and the poster session was very successful. Conference attendance was very high, with more than 500 registered. Many of the agents who participated in the training also attended this conference for the first time.

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**SARE grant \$ 97,500**





## Community Food Security and Marketing Capacity Development in Kentucky

The U.S.D.A. Southern Regional Sustainable Agriculture Professional Development grant, provided to the Commodity Growers Cooperative (CGC) and several partners, enabled extensive collaboration with non-governmental organizations, provided participatory training and development projects for a wide variety of non-traditional alliances, and further advanced the goals of promoting sustainable agriculture in this state during 1997 and 1998. CGC refers to this collaborative training and professional development component of its work as "Community Based Farm Market Training Project," and this term is used throughout this report. This Annual Report covers activities conducted during a time from from July 1997 through November 1998, although some background information is provided for several components of the project, reaching as far back as 1996.

In addition to the groups and organizations listed as cooperators, CGC has collaborated closely with the Kentucky Department of Agriculture, the Kentucky Governor's Director of Ag Policy, the Community Farm Alliance, Kentucky Farm Bureau and Kentucky Ag Project 2000 and others in achieving the goals of this project.

Presently, political and economic transformations taking place, on both the national and international level, are changing the role of family farming throughout the United States, especially in Kentucky where agriculture is a prime contributor to the state economy. Kentucky's agriculture, with an annual farm gate value of more than \$3 billion and economic impact in excess of \$12 billion, is characterized by small family farms with more than 80% of the farms grossing less than \$40,000 annually. Kentucky's agricultural economy is highly dependent on income from the sale of burley tobacco, and tobacco continues to play a major economic, political, and cultural function for the state.

However, as farming becomes more competitive due to the increasing dependence on automation and technology in sync with the move towards more large-scale, industrial farm production processes, small farms lose their economic viability and rural communities suffer. Therefore, in order to preserve Kentucky's small farms, the state's farming community identified a need for more market development, training, and diversification of agricultural products. By tapping more existing markets and creating new international

markets for Kentucky's agricultural products, some of the uncertainty that goes along with diversification could be mediated. In order to achieve these goals, many groups/farm organizations will have to collaborate together and propose policies which will work in their favor.

In order to work towards diversification, market development, and a sustainable food system in Kentucky, CGC, through the "Community Based Farm Marketing Training Project," decided to join together and propose a number of project goals, including:

- Building community institutional capacity through training programs,
- Organizational development and management assistance and program materials;
- Ensuring access and availability for community residents to residents to fresh, locally produced food; and
- Building and encouraging local markets for farmers and their products.

### Approach

In order to realize these goals, the Project Team identified four specific objectives and developed a work plan to achieve these objectives. These included:

- (1) Building local capacity for improving farmers markets and expanding existing markets into public markets through developing and disseminating guidebooks for market development;
- (2) Organizing community food councils and conducting community food access assessments in targeted communities by providing information and training about successful programs;
- (3) Training community organizations to expand on and replicate the Harvest Festivals organized by Partners for Family Farms, and;
- (4) Ensuring access to marketing and organizational assistance for farmers by providing training to extension agents, farmers, small business assistance programs and others who assist farmers associations in community food issues, market development planning, building access to capital, and organizational management for farmer associations.

*This is the 1998 report, no report was submitted for this project in 1999.*

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Burley Tobacco Growers  
Cooperative Association  
  
Community Food Security  
Coalition  
  
Kentucky CES  
  
Pots de Creme

**SARE grant      \$79,970**





## Training Program Targeting Integrated Cow/Calf Operation Management

Training and professional development opportunities will be provided Oklahoma State University Cooperative Extension Agents, Natural Resource Conservation Service personnel and Farm Credit Services officials to enhance their understanding of techniques of sustainable agriculture as related to the beef industry.

Project participants, herein referred to as "Trainers", will be exposed to the differing segments of the beef industry, the role these segments serve in the industry, and how they may be melded into an integrated package at the cow/calf level.

Trainers will experience the characteristics of beef industry segments through hands-on participation in two case studies of sustainable and integrated ranches as cattle are followed through different production segments.

Trainer experience and knowledge will be used to model case study ranches into integrated operations in terms of animal and forage production, economics and environmental nutrient balance.

Trainers will be exposed to sustainable agriculture techniques through educational tours and study of ongoing, funded field research and demonstration projects involving nutrient balance of intensive grazing operations, best management practices of using poultry litter as a fertilizer or as a feed for beef cattle, and environmentally sound methods of controlling undesirable weed and brush infestations, especially broomsedge.

A forage base evaluation model and computer software will be developed to assist trainers as a decision-making tool for producer recommendations.

Trainers will receive equipment and supplies to enhance educational activities directed toward their target audiences; the commercial cow/calf producer in southeastern Oklahoma.

Trainers will conduct educational activities in their individual communities utilizing professionally designed displays, brochures, professional educational slide sets and narratives and computer software.

A narrative of experiences and observations gained through this project, including major points covered, will be maintained and provided to project participants.

An evaluation of the understanding of sustainable beef and forage production by Cooperative Extension Agents will be conducted at the conclusion of the project.

### Approach

Significant activity has occurred since the last reporting period. Activities include an educator inservice and visit to case study ranch, tour of beef cattle production and research operations in OK, KS and NE, the development of educational display materials, and a follow-up study of factors affecting value of marketed beef calves.

Last December SARE grant participants, including those with OSU Extension, came together for a seminar providing an in-depth look at the management of our case study operations, cow/calf and stocker. Information was provided on land management, business decision-making, and animal performance. At this same meeting, extension educators presented educational talks on topics of their selection. Some topics discussed include the prevention of injection site lesions, dystocia in beef cattle, soil fertility, forage management and integrated beef cattle production techniques.

Visual aids, prepared on Microsoft Powerpoint® are currently being incorporated into a slide set for duplication and distribution to all educators. This should be completed by December 1. The two day inservice was culminated with a narrative tour of the case study operations. Cattle from the case study were also followed through to harvest and processing. Data were collected along the way. A case study report will be written.

Nineteen display boards for use by educators were purchased last year. Educational materials on six topics have been developed, duplicated and distributed for use on these display boards. Four to six more topics will be developed for use this coming spring.

An educational tour of beef cattle production and research facilities integral to those involved in beef production was also undertaken. Extension educators, NRCS personnel and ranchers traveled to stops in KS and Nebraska. The operations were selected because of their importance to the industry as a whole through their research and innovative managerial techniques.

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**SARE grant \$54,340**



## Grassroots Empowerment in Kentucky's Local Conservation Districts

### Objectives

The purpose of the project is to help develop agriculture/conservation leadership at the county/district level and to create a framework of leaders that understand the public significance of the Kentucky Agriculture Water Quality Act, and the impact of the development of water quality plans for each farm on Kentucky's sustainability.

### Approach

This SARE project provides training and guidelines for professional agency representatives, Division of Conservation Supervisors and County Extension Agriculture Advancement Council members from the counties. This cooperative leadership approach is required to accomplish the objective of reaching the estimated 350,000 plus landowners affected by the Kentucky Agriculture Water Quality Act.

A curriculum development committee prepared the curriculum, identified participants and training sites. Fourteen committee members from seven different state and federal agencies and farm organization were involved. Six different statewide workshop sites were selected. Resource materials and personnel were selected along with promoting and enrollment of participants. The overall objective of the workshops was to train grass-root leaders and to prepare them to develop strategies and programs that improve the environmental quality of their agriculture communities by implementing sound environmental practices including efficient stewardship of the natural resources. Fifty-six resource persons representing the Kentucky Division of Conservation, the Kentucky Division of Water, the Kentucky Division of Health Services, the Kentucky Division of Forestry, USDA/Natural Resources Conservation Service, and the U.K. Cooperative Extension Service participated in a workshop in October 1997 that prepared them to direct grass-roots leader team members at the six regional meetings.

### Results

Six, two-day regional farmer grass-root leadership sessions were conducted. Two hundred and fifty-nine grass-roots leaders from 92 Kentucky counties participated in these SARE leadership workshops. They developed leadership skills and gained knowledge in preparing on-farm agriculture water quality plans. Thirty members of

the planning committee and nine guests also participated.

In addition, as a part of this project during 1998 and 1999, eleven SARE leadership scholarships were awarded for the Kentucky Natural Resources Leadership Institute to selected grass-roots workshop and conference participants. The goal of the Leadership Institute is to develop 25-30 leaders per institute who can help groups move beyond conflict and toward consensus building and problem solving for continuous natural resources issues.

A continuing impact to this SARE grant included a two-day conference held November 9-10, 1998 in Frankfort, Kentucky marked a new phase in continuing grass-roots leadership training on sustainable land and water quality management practices.

Speakers from out-of-state and state agriculture leaders were featured. State legislators and environmental advocates were included on the program. Current legislation, policies, and directives regarding agriculture environmental issues were discussed in detail.

This conference showcased:

Southern Regional SARE program leaders from Georgia and North Carolina who joined Kentucky agriculture leadership in making agriculture water quality-related presentation and connected Kentucky's program to related SARE programs throughout the southern states.

Selected County/District Teams sharing through oral presentations and displays their experiences in implementing programs and events as a result of previous years training workshops with the use of tools, such as the Producers' Workbook and resource teams.

A panel of statewide leaders in agriculture and natural resources discussed an up-to-date view of Kentucky's challenges and solutions regarding CAFO, AFO, nutrient management, and other provisions of the Federal Clean Water Act and Kentucky's Environmental regulations relating to agriculture.

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**SARE grant \$86,280**





## Utilizing On-Farm Case Studies for Teaching Advanced Management and Marketing to Extension

Specific learning objectives were developed for each teaching location on six farms. Our efforts focused heavily upon using the systems approach to decision-making and to train county Extension faculty to teach farm families about the development and implementation of alternative management and marketing strategies. Obviously, the systems approach involves integrating production, management, marketing, and environmental concerns into a total plan, including the development of marketing plans. The training was an advanced series for Extension personnel on these topics with application of the teaching materials to actual farming operations and farm families in a given Extension service district. Attention was focused on behavioral changes in the Extension staff which should stimulate their audiences to implement positive changes.

Specific objectives were as follows:

1.) Extension personnel will learn and teach farmers improved strategic planning and management strategies.

2.) Extension personnel will learn and teach farmers improved marketing strategies.

### Approach

The sustainable agriculture planning process in Tennessee identified the systems approach to decision making and implementation of improved marketing strategies as high priority subjects. The training program included using a case study approach in addressing these subjects. Training was conducted in 12 sessions on six different farms across the state. Specific subject matter was modified to match different educational program needs for Tennessee's diversified agriculture. Relevant examples were tailored for each training location.

Training sessions involved integrating production, management, and marketing into a total plan. Information management systems were incorporated as a critical part of total resource evaluation on case study farms.

Advanced management and marketing training topics were taught in classroom style sessions with Extension personnel for the first half of the training. The second half of the training was conducted on an actual farm. Extension personnel discussed management and marketing strategies used on the farm by the farm

family. The discussion focused on an evaluation of strengths and weaknesses of decisions made on the farm and the likely outcome of alternative decisions.

Project goals and objectives involved teaching agents to teach the above subjects to other farmers. Actual experience in working with a given farm family reinforced the relevance and importance of the subject matter. As a part of the training process, farm families were to interact and question Extension agent suggestions and recommendations. Farm families at the six locations were an integral part of the teaching package.

A total of 618 agent days of training was conducted in the 18 training sessions.

A comprehensive evaluation of the original training revealed the following outcomes:

- Agents indicated a 30 percent perceived increase in their knowledge and understanding of long-run strategic planning.
- Agents reported a perceived 32 percent increase in their ability to assist a farm family in addressing the "right" questions and developing a long-run farm plan.
- Agents also indicated a perceived 27 percent increase in their abilities to help farm families develop and evaluate management and marketing alternatives.

Feedback from Extension agents over the past several months indicated they have effectively utilized teaching materials included in the training. Future sustainable agriculture training under this project will focus on continued follow-up to this training and further application of the systems approach to decision making with emphasis on advanced farm management and marketing strategies.

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**SARE grant \$10,000**



## Integrated Production of Sustainable Crops for Small Farmers in North Florida

### Objectives

The objective of this Training Enhancement Project is to develop educational materials and demonstrations of alternative crops and production practices to support training in sustainable agriculture for Extension agents, other public agency professionals such as those working for the Department of Environmental Protection, the Natural Resource Conservation Service, and the Florida Water Management Districts, and leaders from the North Florida small farm community.

Specific objectives are to:

1. Train at least 30 county Extension faculty members and at least 30 farmers and other professionals in the concepts of multi-crop farming systems emphasizing native crops and ecologically sound production practices.

2. Assist county faculty in the establishment of demonstration plots utilizing these crops and principles on farms in North Florida.

After spending the first year of this grant project gathering information and materials, revising existing publications, and developing new publications and other resources, we held two in-service trainings for county Extension faculty, growers and others. University of Florida faculty collaborated with personnel from the University of Georgia to develop these resources and present the training activities.

The first of the planned in-service trainings occurred on November 18, 1998. This activity taught county Extension faculty about sustainable, alternate crops and their production in the north Florida and south Georgia areas. Topics and speakers included:

- 1) Verti-Culture Production of Berries and Vegetables

- 2) Fresh and Dried Cut Flower Production
- 3) Production of Pecans and Other Nuts
- 4) Muscadine Grape Production
- 5) Potential for Wildflower Seed Production
- 6) Strawberry Production in North Florida

Unfortunately only six county Extension faculty chose to participate in this event.

In contrast, over 260 people participated in the second planned activity on July 14 and 15, 1999. The "Ornamentals and Fruits Field Day" showcased the University of Florida's collections of ornamentals, native plants and fruits at

the North Florida Research and Education Center in Monticello.

Using an "open house" format, the one-day training was offered to over 120 growers, other professionals and county Extension faculty on July 14, and was repeated for over 140 Master Gardeners and county Extension faculty on July 15. Extension Specialists from the University of Florida and the University of Georgia gave guided tours and provided commentary about growth, production, functional use, sustainability and aesthetic value of the fruit, native and ornamental species viewed during the tours.

Plantings featured in tours and presentations were:

- 1) Crape Myrtles (highlighting the mature forms, bark color and flowers of over 70 cultivars;
- 2) Native Wildflowers;
- 3) Native Grasses;
- 4) Pecans
- 5) Figs and Citrus for North Florida
- 6) Grapes and Blueberries
- 7) Ornamental Vines (40+ species;

An additional presentation was entitled "Monitoring for Pests and Using Biocontrol" (Russ Mizell, Entomology, University of Florida, NFREC-Monticello). Although not related to alternative crops, the presentation discussed concepts of sustainability associated with Integrated Pest Management (IPM).

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**SARE grant      \$8,375**





## Development of Sustainable Beef Checksheet, Manual and Workshops

### Objectives

1. Through the design, evaluation, and subsequent use of a sustainability check sheet, educators and producers will learn what to consider in assessing a beef cattle farm

2. Through the use of a manual on sustainable beef cattle management, educators and producers will learn the complex (biological, financial and social) interrelationships that must be considered when planning and improving beef cattle enterprises in a whole-farm context

3. Potentially 180 educators and producers will be trained, through two sustainable beef management workshops, to recognize and assess these interrelationships.

### Approach

This project was intended to stimulate critical thinking of beef cattle producers through development of a checksheet for assessment of farm sustainability and subsequent training of educators and producers in use of the checksheet. Additionally, publications to support portions of the checksheet have been assembled into a notebook used for training. The intent was to establish a systems perspective and present interrelationships rather than components, and to present series of questions educators could use to work with farmers to illustrate how one decision can impact other decisions and outcomes.

Objective 1. Through the design, evaluation, and subsequent use of a sustainability check sheet, educators and producers will learn what to consider in assessing a beef cattle farm.

A group of individuals (producers, NRCS personnel, county extension agents, and NCAT/ATTRA technical specialists) developed a beef farm sustainability check sheet. This diverse set of individuals took ownership of a project and learned from each other to help farmers through forming teams. The check sheet contains over 200 questions to assess a farm with primary emphasis on cow-calf production on pasture programs. The questions are not designed to determine if a farm is sustainable but rather to determine individual areas of the farm that could be improved. The questions are designed to show the interrelationships of decision making. They also provide a basis for educators, whose expertise may be in another area,

to have questions they can ask the farmer.

The check sheet is available to ATTRA callers as a standard materials item and is on the ATTRA website as well. During this calendar year, 106 persons from 33 states have requested the checksheet. Over nine hundred persons have "hit" the checksheet on the website. A presentation on the check sheet was made at the Southern SARE PDP meeting in Memphis in 1998. A poster was used at the meeting in 1999. Additionally, presentations on the sustainable beef workshop and check sheet were made in 1998 at the Southern American Society of Animal Science meetings. A poster presentation was made at the SARE meeting in Austin in 1998. Other presentations have been made to county cattlemen's groups and various workshops in other states.

2. Through the use of a manual on sustainable beef cattle management, educators and producers will learn the complex (biological, financial and social) interrelationships that must be considered when planning and improving beef cattle enterprises in a whole-farm context.

A notebook of ATTRA publications, research reports, and other information was assembled to be used in workshops, as the precursor of the manual. Publications updated or developed for the project are now available through ATTRA by request or through the ATTRA website.

Integrated Parasite Management  
Assessing the Pasture Soil Resource  
Nutrient Cycling of Pastures  
Sustainable Soil Management  
Matching Livestock and Forage Resources in Controlled Grazing  
Meeting the Nutritional Requirements of Ruminants on Pasture  
Introduction to Paddock Design and Fencing-Water Systems

Potentially 180 educators and producers will be trained, through two sustainable beef management workshops, to recognize and assess these interrelationships.

The first workshop using the check sheet as a base learning tool was held October 7-9, 1997, at the Highland Rim Experiment Station in Springfield, TN. Enrollment was 42 producers, extension agents and NRCS personnel from seven states. The second workshop was taught

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SARE grant \$69,936

September 21-23, 1998, at the Middle Tennessee Experiment Station in Spring Hill, TN. Enrollment was 23 producers and educators from eight states. Three two-day workshops for Arkansas NRCS personnel were held in Fayetteville, Russellville, and Marshall, AR with a total attendance of 93 persons. ATTRA specialists participated in a sustainable agriculture conference in Kingsport, TN February 26-27, 1999, and presented four sessions on the checklist and conducted a pasture walk for approximately 40 people. A conference on sustainable beef management was held in collaboration with Heifer Project International in Epes, Alabama, March 26-28, 1999.

### **Impacts and Contributions**

The checklist is a tool for educators to use a whole-farm approach to beef operations, to analyze the farm and identify "problem areas" and structure information geared to the producer's goals through a better understanding of educational needs of the farmer. We have learned from farm visits and workshops that the checklist is very complete and does stimulate critical thinking.

The check sheet is long and complex; therefore, an abbreviated version has been developed for educators to use with persons who may not be as advanced in their production system as those who benefit from using the longer version.

Feedback from producers has been very positive, even though they found working through the checklist was a challenge for them. Educators have been mixed in their reviews, primarily from the standpoint they have concern that "average" producers would use it. An important contribution of the check sheet has been the benefits of bringing together a diverse group of individuals. Thought processes of individuals have been expanded, more collaborative programs developed, and other grant activities planned.

A producer network has been established from the group developing the checklist and producer grant activities are being discussed. One producer, who was involved in the process, has been involved in several programs and workshops, illustrating that farmers can be used to "educate educators". Another producer involved in the process indicated that working on the checklist was the start of a new phase of thinking about the cattle business.

Still another producer indicated that she was of the opinion she was doing a good job but after going through the checklist, she defined "twenty" things she needed to be working on.

In one state the checklist was used to train new extension agents as to how to work with producers. A great concern in the educational system is having personnel at a local level with the experience and enough understanding of agriculture to work with farmers.





## Alternative Sustainable Agricultural Practices for Selected Crops in Puerto Rico

### Objectives

1. To stimulate agricultural professionals, producers and other groups to get involved and aware of alternative sustainable practices for coffee, starchy crops, and general agriculture production.
2. To collect sustainable practices in the referred subject matter from farmers, agricultural professionals and interested institutions.
3. To prepare three abbreviated compendiums containing such practices.
4. To distribute the information among the above mentioned clientele.
5. To follow up adoption of those practices.
6. To enhance our sustainable agriculture strategic and training plans.
7. To prepare materials available for other countries and Spanish audiences in the United States.

### Approach

In 1997 the Agricultural Extension Service received a grant from the SARE Professional Development Program for the development of a project to compile, develop, publish and distribute information about sustainable agricultural practices in coffee and starchy crops. It was justified by the lack of recent educational materials related to reducing the impact on the environment from severe soil erosion and the intensive use of pesticide in the steep lands of Puerto Rico.

More sustainable practices were once used by farmers, but modern intensive culture replaced them. With the collaboration and help of farmers, agronomists of different agricultural agencies, investigators, conservationists, ecologists, leaders and specialists we are collecting and recording information about sustainable practices for dissemination among the clientele.

A literature review turned up important information in books, scientific journals, technical magazines and other publications.

Not many activities were conducted this year because of the severe damage and problems caused by hurricane Georges to the agriculture of the island. After the hurricane it was difficult for farmer to concentrate on the project because the destruction of the farms depressed them. Farmers and professionals were very busy attending this situation. In spite of that lag in

activities, the time of change was used to take spur adoption of sustainable practices in the recovery of coffee and starchy crops plantations, especially in pruning, fertilizing and soils conservation practices.

A meeting was held with researchers, farmers, extensionists and other people to made the final review of the compendiums. Three meetings were held for this purpose. They agreed to prepare two compendiums instead of the three proposed originally in the objectives of the proposal. They decided it would be better to combine the conservation practices for coffee and starchy crops in one compendium.

A field evaluation was made to observe how sustainable practices were adopted by farmers and to obtain their experiences. During farm visits we observed a seventy percent (70%) of performance.

A graduate student is carrying on a experiment to determine the economics of pruning coffee plants in a sustainable manner.

Printing of the compendiums was initiated by receiving bids at the Finance Office of the Agricultural Extension Service.

In general, the experience was a good one in terms of the attitudes changes, collaboration, involvement of the participants and the educational materials produced. People are motivated to adopt the sustainable practices on their farms. When completed the compendium will be of great value to farmers and have positive effects on the preservation of the environment, economic benefits and social justice for all.

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**SARE grant     \$10,000**



## Integrated Strategic Plan for Sustainable Agriculture

### Objectives

1.) To establish goals, objectives, standards and guidelines to develop sustainable agriculture in the College of Agricultural Sciences of the University of Puerto Rico.

2.) To design and develop an initial Integrated Strategic Plan for Sustainable Agriculture (ISPSA).

3.) To motivate the integration of the three units of the College of Agricultural Sciences by creating a team to design and develop the ISPSA. The team will include representatives from the teaching, research and extension groups at the College of Agricultural Sciences.

### Approach

The University of Puerto Rico's College of Agricultural Sciences (UPRCAS) initiated the development of its Integrated Strategic Plan for Sustainable Agriculture (ISPSA) in December, 1997. The Dean of the College of Agricultural Sciences designed a team of ten faculty members to lead the development of the strategic plan. This team, led by Dr. Hipólito O'Farrill-Nieves, includes representatives from the teaching, research, and extension groups at the College, and has been designated the Committee for Sustainable Agriculture (CSA). A graduate student specialized in planning was brought into the CSA, a move that has been helpful to its strategic planning process. Also, the recruitment of this graduate student has initiated linkages between the College of Agricultural Sciences and the UPR Planning School.

In 1998, two scientists nationally known for their expertise in areas related to sustainable agriculture participated in our strategic planning process. These were Dr. Aref Abdul-Baki, a plant physiologist from the Agricultural Research Service, USDA, Beltsville, Maryland, and Dr. Charles A. Francis, professor of agronomy and Director of the Center for Sustainable Agricultural Systems at the University of Nebraska-Lincoln. Dr. Abdul-Baki visited the UPR College of Agriculture on March 16-18, 1998, and presented the seminar "Advances in Sustainable Agriculture: Research and Perspectives." Dr. Charles A. Francis visited Puerto Rico on April 21-25, 1998, and presented the seminar "Agroecology and Sustainable Agriculture" ("El Diseño Agroecológico de una agricultura sustentable"). Dr. Abdul-Baki and Dr. Francis assisted the CSA

in establishing the preliminary goals, objectives and action plan for the ISPSA.

The goal of the CSA for 1999 was to develop the first draft of the strategic plan to receive the input of farmers, county agents, the Natural Resources Conservation Service (NRCS), the Puerto Rico Department of Agriculture (PRDA), and other stakeholders of the UPR College of Agricultural Sciences. In the first semester of 1999, the CSA had four meeting sessions with 16 growers, five county agents, and 18 undergraduate students to give them the opportunity to participate in the development of the first draft of the strategic plan.

On June 24, 1999, the CSA presented the first draft of its strategic plan at the Puerto Rico Sustainable Agriculture Conference, held at the UPR Mayagüez Campus. One hundred and fifty copies of the first draft were distributed among the attendees for comments. Also, in 1999, four members of the CSA visited the University of California at Santa Cruz and Davis to share ideas about the implementation of extension, research, and teaching programs on sustainable agriculture. The CSA will use these experiences to develop the ISPSA.

The CSA has planned a series of regional meetings, to be held from November, 1999, to February, 2000, to interact with farmers and other stakeholders of the UPR College of Agricultural Sciences. These meetings will enable to participate in identifying the relevant issues that must be addressed, and the systems approaches, interdisciplinary efforts, and multi-institutional partnerships that are necessary to develop sustainable agriculture in Puerto Rico. In November, 1999, a copy of the first draft of the ISPSA will be mailed to all of our college departments, research stations, and student organizations. Also, it will be sent to the NRCS and the PRDA district offices, farmers' associations, and other non governmental organizations, and selected individuals. A revised version of the plan will be distributed to these individuals and organizations in March, 2000. The final version of the ISPSA will be submitted in October, 2000, to the Southern Region of SARE.

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**SARE grant     \$25,740**





## Sustainable Agriculture Training Initiative for Texas

### Objectives

Extension agents, NRCS personnel and other agricultural professionals will be able to explain the concept and encourage their clients to consider the environmental and social consequences in addition to economics when making farm decisions.

The Texas Agricultural Extension Service and the Prairie View A&M University Cooperative Extension Program, other agricultural and natural resource agencies, and alternative agricultural producers will increase communication and strengthen their working relationships to expand the concept of sustainable agriculture in Texas.

### Approach

Almost 600 county agents in Texas attended a two-hour training session which included a basic introduction to the concepts and principles of sustainable agriculture and information about sustainable agriculture resources that they can access to help the producers they serve. Resources developed include a website (a video illustrating farmers and ranchers in Texas working towards sustainability, and a display for meetings and trade shows. A regional meeting "Developing East Texas Sustainable Agriculture Systems for the 21<sup>st</sup> Century" was held in July, 1998. Activities associated with this grant have improved communication among professionals of the Texas Agricultural Extension Service, the Prairie View A&M University Cooperative Extension Program, and alternative agriculture practitioners and groups.

### Outcomes and Accomplishments

Objective 1. Between August, 1998, and April, 1999, our program introducing the concepts and principles of sustainable agriculture was presented to county agents in all 12 Extension districts in the state. A regional workshop, "Developing East Texas Sustainable Agriculture Systems for the 21<sup>st</sup> Century" was conducted in the summer of 1998.

Objective 2. The video, which was shown to all agents, included interviews with Texas producers using alternative methods. Alternative producers and representatives of producer groups such as Texas Organic Growers Association (TOGA), and Holistic Resource Management (HRM) were among the speakers, tour

stops, and participants in the meeting in East Texas. Specialists have been invited speakers at alternative agriculture meetings, such as ACRES, and are serving on the boards of HRM of Texas and TOGA. Agents are working with NGOs such as Promised Land Network to help educate producers and the public.

### Dissemination of Outcomes

The Texas Sustainable Production Systems website was developed and expanded throughout the term of the grant. Our 22 minute video, completed in the spring of 1998, contains interviews with 7 Texas producers who are working towards sustainability on their farms or ranches. All county agents who participated in the training were shown the video. Copies were given to all participants in the video, and to any county agents who requested it. It is for sale to the public on our website.

The display illustrating sustainable agriculture in Texas was developed and is available to Extension agents and professionals from other participating agencies. It has been displayed at the Southern Region SARE meeting in January, 1999; the Stiles Farm Field Day in central Texas in June, 1999; and the statewide Extension staff conference at College Station in July, 1999. Illustrated SARE handouts on sustainable agriculture are distributed with the display.

### Potential Benefits and Impacts

The loss of so many producers indicates that major changes are needed within agriculture. Extension and other agricultural professionals must be innovators and develop creative programs, which encourage producers to use improved methods of farming. Our introduction to the principles of sustainable agriculture was intended to encourage these professionals to work with alternative producers, use a variety of sources for their information, and introduce conventional producers to alternative methods of approaching the challenges they face.

We have met our objectives of providing this basic training program of concepts of sustainable agriculture to all county agents in Texas. This included an introduction to the definition and concepts of sustainable ag, explanation of our website and computer resources, and information about some alternative agriculture groups and resources. After training surveys. We did not

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SARE grant      \$70,136



find a significant change in the perceptions, and there was a non-significant trend towards increased knowledge. Although initial attitudes about sustainable agriculture were more positive than we had anticipated, (3.6 on a 1-5 scale, with 5 being the most agreeable), they did increase slightly (to 3.7) after the training. There was also an increase in their actions about sustainable agriculture with more of them reporting that they had conducted sustainable agriculture activities in their counties.

Many have personally expressed that they would like to recommend alternative methods, such as products which are "environmentally friendly". However, they often do not have the information to do that. Although many specialists and research scientists would like to conduct alternative research programs, they have trouble finding the support to do this. One specialist who attended the training expressed this in his comment: "As a specialist, I believe my time would be better spent developing materials that would support the sustainable ag program's efforts. I am working with agents and other specialists to develop fact sheets, slide shows, etc. that address specific needs and issues within my expertise and job responsibilities. Hopefully my efforts will complement those of other specialists and agents as we address specific issues within the more general sustainable agriculture package."

The real changes that we noticed during the time of this grant do not show up in the surveys. During the years of this grant, we observed changes in the attitudes of many agents. Two districts requested training sessions in organic farming/gardening, and several agents requested producer/homeowner programs on these subjects. Open-minded agents are finding that there are quite a few producers and homeowners who are interested in non-traditional agriculture. This program helped to reinforce the idea that they have the approval of the administration to pursue these types of programs.



## Oklahoma Master Woodland Owners program

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SARE grant \$23,640

### Objectives

1.) Identify, through a nomination and screening process a cadre of opinion leading non-industrial private forestland (NIPF) owners who are willing to attend 10 educational sessions on advanced forest management at no cost, in exchange for agreeing to spend an equivalent amount of time (approx. 100 hours) in forestry and wildlife management diffusion activities in their communities. Also, county extension educators with an interest in forestry and/or wildlife management will be invited to enroll (several have already expressed an interest in participating).

2.) Conduct 10 educational sessions on topics of forest and wildlife management for NIPF owners and county extension educators.

An array of scientifically-based forest management demonstration sites on NIPF lands throughout eastern Oklahoma will be created by participating NIPF owners. Such sites can then be used by professional foresters, extension educators and opinion-leading landowners as outdoor instructional sites for other NIPF owners, youth, and the general public.

Monitoring of forest management practices adopted, diffusion activities and time spent in such activities, number of people impacted, and acres impacted will be accomplished.

### Approach

*The Coverts/Master Woodland Owners* genre of cooperative extension educational outreach programming has become a marquis of extension forestry and wildlife outreach efforts in a number of states. Project goals are to: (1) facilitate the creation of an array of scientifically-based forest management demonstration sites on non-industrial private forest (NIPF) lands throughout eastern Oklahoma that can be used by professional foresters, extension educators and opinion-leading landowners as outdoor instructional sites for other NIPF owners, youth, and the general public; (2) train a cadre of private forestland owners in outreach skills and conflict resolution such that they can assist professional foresters and county extension educators in having a positive impact on debates over natural resource issues in communities, and (3) increase the knowledge, skills, and abilities of county extension educators and opinion-

leading private forestland owners in the scientific disciplines of forestry and wildlife biology.

The target audiences of this project will be community leaders who own forest land and county extension educators. The program will utilize a mixture of classroom instruction flavored strongly with audio-visual aids, field demonstrations and exercises, expert guest speakers, role-playing, and self-directed learning opportunities. Ten sessions will be held, spread over 12-15 months. Each session will consist of an evening program (7:00 p.m. -10:00 p.m.), followed by either a half-day of classroom activities and a half-day of field activities or a full day of field activities (e.g., tours, demonstration sites, and/or practical individual or group field exercises).

We expect that each individual will, at a minimum, perform in-kind outreach activities (tv/radio appearances, article writing, assuming community leadership positions on local boards, creating demonstration sites and holding demonstration field days) equivalent to the number of hours (100) that person spent in the Master Woodland Owner training program. Results will be evaluated using pre and post test survey instruments to determine increases in knowledge, skills, and abilities of science-based forest management, amount of time spent diffusing information in the community, number of people impacted, and number of acres of forestland impacted.



## Motivating Teams for Enterprise Facilitation

### Objectives

1.) Create a social infrastructure for development of sustainable agricultural enterprises.

Several levels of resource networks will be developed:

1.1 Enterprise specific networks. Twenty-one pairs of farmer/entrepreneurs and agents (7 in each state) will establish networks in three states—KY, TN, AR.

1.2 State networks. Two sorts of state networks will be established in each state. One is a supportive network of farmer/entrepreneurs. Another is of agents and other service providers for sustainable enterprise development.

1.3 Multi-state and national networks, especially marketing networks.

1.3.1 Develop a Delta Marketplace of Ideas based on North Dakota model.

2.) Develop agents' skills in Enterprise Facilitation. Formal session and experiential, dialogue-based shared learning will develop skills in both farmer/entrepreneurs and agents in five areas:

2.1 Basics of business planning.

2.2 Facilitation of groups.

2.3 Financial and credit management.

2.4 Policy opportunities, availability of government assistance.

2.5 Emerging markets and market strategy—especially niche and sustainable markets.

3.) Develop a mechanism for self-sustaining multiplication of enterprise facilitation skills.

3.1 Farmer/entrepreneurs become mentors. Farmer/entrepreneurs will develop presentations and booths describing their sustainable enterprises and present these exhibits at Delta Marketplace.

3.2 Facilitators train other facilitators. Agents will use what they have learned during the training to develop training sessions at Delta Marketplace.

3.3 Institutional network of support will be created for Delta Marketplace.

State Department of Agriculture, Farm Bureau, commodity groups and other key farm organizations will be contacted and recruited to support the Delta Marketplace.

3.4 Establish virtual Marketplace. All enterprise exhibits and trainings will be continuously available on [www.deltanetwork.org](http://www.deltanetwork.org) for continuing dialogue.

3.5 Publish Delta Marketplace Directory of enterprises and resources.

3.6 Establish integrated planning/evaluation systems to insure continuous improvement. This will include regular entrepreneur evaluation and "restrategizing."

### Approach

Environmental degradation, poverty and dependence on raw commodity production seem inextricably intertwined in many parts of the South. However, just as these problems feed one another, solutions to one can also help solve the others. For example, farmers most quickly change their practices in response to market opportunities, many of the most profitable markets require value-added processing of sustainably produced commodities and this processing can create jobs in rural areas. Delta Enterprise Network (DEN) is working to catalyze opportunities with these three characteristics.

To accomplish this in the "motivating teams" project we are creating new curricula and training protocols based on case studies of successful local, eco-friendly, value-added diversification in the Delta. One such case study features a farmer who began attending DEN meetings six years ago as a conventional cotton and soybean grower. Based on contacts and information received from DEN and his own perspicacity, he now manages an organic and edible soybean production and processing operation which had \$12 million in exports last year.

Other case studies will include fresh water shrimp, sweet potatoes, hybrid striped bass, aromatic rice, farm management computer support, white corn, organic cotton, nursery crops, spinach, identity-preserved grains, catfish feed, tillage tool manufacture, healthy home insulation from natural fibers, kenaf, blueberries, a winery, a butcher shop, an orchard/restaurant, a catfish production/restaurant and compost from cotton gin trash.

The case studies are being developed and explored by a team of professionals which has expanded far beyond the original cooperators in the project.

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**SARE grant      \$96,000**





## Multi-Disciplinary Training on Pasture-Based Dairy Systems

### Objectives

The objective of this program is to provide the impetus for the adoption of pasture-based dairy farming in the Mid-Atlantic region. To accomplish this there are three components:

A. Knowledge will be gained of pasture based dairying practices at research stations and on dairy farms in Ireland and this knowledge will be adapted and implemented on farms in the Mid-Atlantic region. Extension educators, other professional and farmers will learn new ideas and practices which can have positive impact on work and quality of life for dairy farm families in the Southeast.

B. Attitudes among agricultural professionals about the possibilities of pasture-based dairying will be changed. Participating professionals and farmers from the Mid-Atlantic region will be trained and will offer educational programs to provide information and support the adoption of sustainable pasture-based dairy production systems.

C. Innovative farmers and advisors will meet on a regular basis to discuss sustainable alternative dairy management practices and solve problems.

### Approach

In August/September, 1998, a group of 15 traveled to Ireland and Northern Ireland on an intensive 10-day study tour of pasture-based dairy production systems. This team-building experience included visits to 13 private farms in the two countries. In addition, the group visited Greenmount College, Crossnacreevy Plant Testing Station, Hillsborough Research Centre, and the Moorepark Research Centre. Evening programs included discussions with an economist from Teagasc (Irish Extension) and with three consultants from Australia and New Zealand who were working in Ireland. During the tours, discussions centered around such issues as grazing management, extended grazing seasons, supplements for pastured cows, economics of pasture-based dairies, heifer rearing, reproduction of high vs medium genetic merit cattle, farmer discussion groups, social and public issues surrounding farming including issues of animal welfare and environment. The group documented the visits with written notes, photographs, and video. Participants paid close at-

tention to the knowledge that could be applied to dairy farming systems back home in the U.S. and returned to plan summer training sessions to share the knowledge gained from the Irish fact-finding tour. In addition, the training sessions included economic summaries of pastured-based dairy farms, dairy grazer farm stories, and research data from the United States including data from two SARE projects from SC and NC. The sessions did report on what was learned in Ireland, but emphasized opportunities for pasture-based dairy farms as part of a viable dairy industry in the Southeastern U.S.

Training sessions were held in South Carolina, North Carolina, and Virginia during June and July of 1999 and over 120 individuals participated significantly in the sessions including 38 presenters. Presenters and participants included graduate students, dairy farmers, extension agents, NRCS personnel, university faculty, veterinarians, consultants, and other dairy industry representatives. States represented included: South Carolina, North Carolina, Virginia, Kentucky, Tennessee, Georgia, Alabama, West Virginia, Texas, New York, Pennsylvania, Maryland, Arkansas, Wisconsin, Ohio, and Iowa.

The training focused on pasture-based dairy production systems and on the economics of running a dairy operation as a business. Each session was conducted over a 3-day period and included several exercises, presentations, and extensive discussion. Six pasture-based dairy farms served as hosts for field demonstrations during the various sessions. Demonstrations and discussions included grazing methods, forage identification, fencing and lanes, manure systems and cow management. One major part of the training was the group breakout sessions where participants were assigned to design a dairy operation and required to provide detailed economic plans and projected expenses and incomes. Participants were given a resource notebook that included materials concerning grazing systems and economics of dairying.

A highlight of each of the training sessions was a farmer panel featuring five to seven successful dairy graziers from several states.

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**SARE grant \$52,578**



## **Grazing Management Training to Enhance the Sustainability of Pasture-Based Beef Production**

### **Objectives**

The objective of this program is to provide training support to farm agency advisors and livestock farmers who want to learn more about economical, environmental and socially sustainable farming systems.

1.) Participating professionals will be trained specifically in pasture/livestock management so that they can offer educational programs and provide information and support to farmers who want to adopt sustainable and environmentally sound pasture-based livestock production systems.

2.) Selected farmers and farm advisors will organize educational activities and regularly meet on farms to discuss sustainable livestock management practices and solve problems.

### **Approach**

This training project focuses on helping farmers and farm agency workers within and outside of North Carolina develop a sustainable approach to pasture-based livestock management. We conducted three "in-depth" training programs with significant amount of "hands-on" field exercises to reinforce classroom discussions. We have developed several hours of lecture and field exercises with supporting visuals which can be used as resource material for follow-up educational programs. We fully expect this material to be used by many agency workers and by vocational education teachers in the Southern Region.

In 1999 we conducted three grazing schools (2-days each) for 27 farmers, 16 agency workers and 21 veterinarians. We also conducted one 9-day pasture ecology school for 27 NRCS workers from around the USA, and this program provided us with an opportunity to video tape 31 hours of classroom discussions lead by 12 teachers.

We also video taped more than 6 hours of field activities. All of the edited tapes will become part of the final resource package at the end of this project. We have scanned and photographed many plants and animals to be used in a resource CD-ROM which will serve as a companion to the teaching modules that will be finalized during the next year. We have developed Powerpoint presentations, with appropriate visuals for more than 20 hours of lectures

on pastureland ecology that will be included on the CD-ROM; these presentations will serve as valuable resource for the Master Graziers and others who will conduct future educational meetings and for vocational education teachers who discuss grassland management in high school classes.

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**SARE grant      \$31,745**



## Training in Value-Added Syrup Crops

The production of sweet sorghum for syrup in the United States dropped to 2.2 million gallons in 1959 and to 1.9 million gallons in 1960, the last date of data collected by the United States Department of Agriculture. The production of sugarcane for syrup dropped to 3.6 million gallons in 1960 and to 2.6 million gallons in 1969, the last date data was collected. These cash crops have continued to decline as indicated by a 14 county extension survey in Mississippi by 1995 of 31 acres of sweet sorghum and 70 acres of sugarcane and in 1997 of 14 acres of sweet sorghum and 48 acres of sugarcane. In Mississippi this decline has been due to non-sustainable complex practices of production, harvesting, processing and marketing.

There is a long list of problems given by producers of which excessive labor, reduced yield, winter kill, very low market prices, few and poorly equipped processing plants, and poor quality syrup are frequently cited. Even though the gross returns for sweet sorghum and sugarcane for syrup are in excess of \$1500.00 and \$2,500 respectively, and even though the Alcorn Cooperative Extension Program has conducted several total practice production demonstration in years past, the industry has not blossomed to its' full potential. A systems approach to the industry, including training for producers, educators and researchers is a must.

This project will provide on-farm demonstration of sustainable production and harvesting practices and highly visible public demonstrations of sustainable processing and marketing practices. Mobile harvesting, juice extraction, syrup processing and marketing equipment, called the Mill On Wheels, is available from Alcorn Cooperative Extension Program and will be utilized in this project. During demonstrations, producers, professionals and the general public will attain hands-on training in an integrated systems approach to sustaining a value-added agriculture product. Producers will be shown how to apply for SARE Producer Grants to address the syrup crop problems. Successes of systems will be promoted by reports, publications, news articles, slide programs, videos, displays at public events and e-mail groups.

### Objectives

The main objective is to demonstrate a sys-

tems approach through which to train producers, educators, and researchers in the syrup industry so as to sustain sweet sorghum and sugarcane syrup production, harvesting, processing and marketing, and to make a significant contribution to rural development and building of rural social capital.

This is a total systems approach project, dealing with applied research/demonstration as an educational tool to reach small, low income and socially disadvantaged farmers and revive the sweet sorghum and sugarcane syrup industry. This project seeks to sustain syrup production on small farms by establishing sustainable production, harvesting and processing methods through appropriate technology, researching consumer syrup preference, product development and demonstrating the processing operation as entertainment/point of sale marketing. Further, this project will encourage development of new products from these crops, i.e.; sorghum cider, sugarcane cider, pasteurized juice, juice blends; watermelon/sugarcane, muscadine/sugarcane, syrup blends; sweet sorghum/corn syrup, sugarcane/corn syrup, sweet sorghum/sugarcane syrup, watermelon/sugarcane syrup, compost/mulch of baggas by product and other products that could utilize the processing facility and enhance marketing through out the year.

### Approach

During 1999 the team took the mill to approximately 20 demonstrations at heritage festivals and fairs. Local farmers brought cane and sorghum to the demonstrations where they not only learned to process syrup but also had the opportunity to market the value-added product to the spectators. The number of farmers involved increased from about 50 in 1998 to about 70 in 1999. Small farmers from all parts of Mississippi are becoming involved including some from the Choctaw tribal farm. The Hinds County Penal Farm also produced sweet sorghum, with some inmates learning to grow and process it into syrup.

In 2000 a new smaller processing unit will be built just for educational events in order to ease the scheduling demands on the big unit which is needed for production on farms now that more farmers are participating. The project will also add activities in at least one county in both Louisiana and Alabama.

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Mississippi State Fair  
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Mississippi Agriculture  
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Neshoba County Fair  
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Southern University CES

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**SARE grant \$99,912**





## Training in Agriculture Program (TAP)

### Objectives

1.) Identify fifteen limited resource, minority farmers in one or more of the targeted service counties (i.e Warren, Franklin, Person, Granville, and Vance).

2.) Based on training assessment outcomes, identify five major areas of sustainable agriculture practices.

3.) Compile a data resource bank on area training resources by conducting a quick response survey mailing to area and regional agriculture and interrelated agencies and institutions on availability of training resources and training facilitators.

4.) Improve capacity building techniques.

### Approach

The TAP Program provided farmers with an opportunity to learn first hand how to apply the methods of dry irrigation and value-added to leafy greens. Limited Resource, minority and small family farmers in the Region K areas of North Carolina have organized to form a cooperative business in an effort to capture and harness the markets for fresh fruits and vegetables. Fifteen limited resource farmers were identified to participate. A farmer survey was developed based on needs. It provided the background to produce educational workshops on sustainable agriculture, organic practices, risk management, co-op development and financial management.

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**SARE grant     \$17,890**



## Multimedia Training Resources on Sustainable Greenhouse Vegetable Production

### Objectives

1.) Decrease the use of broad-spectrum and high-risk pesticides in greenhouse, with attendant environmental benefits. This will be accomplished by creating a high-quality 15-minute training video containing information about biological controls and reduced-risk pesticides.

2.) Decrease greenhouse use of high-analysis soluble chemical fertilizers and increase the use of composts and organic fertilizers, thereby reducing nutrient pollution of waterways and ground water. This will be accomplished by creating a high-quality 15-minute training video on use of organic media and fertilizers.

3.) Increase the ability of trainers to advise on economic sustainability and sustainable cultural practices by preparing 15-page booklets with in-depth information on the topic presented in the videos and cost comparisons of the organic, biocontrol, biorational, and conventional systems.

4.) Increase the ability of trainers to prepare their own web, slide or print presentations on these subjects by creating a web-based digital image library on greenhouse vegetable production.

5.) Distribute and publicize the information developed.

### Approach

A project coordinator has been hired to direct the program. The coordinator contacted each of the project participants to evaluate the needs of respective individuals, interest groups, commodities, constituencies, and communities. Cooperators were asked about the information needs of their audience, how the sustainable aspects of the video can be emphasized, how much technical detail should accompany the video, ideas regarding useful images for the database, and the type of printed information that should accompany the video.

Participants viewed videos on greenhouse vegetable production previously produced at North Carolina State University and North Carolina A & T State University. Participants were asked to critically evaluate the videos and to draw out concepts and information that needed to be included and expanded upon in the upcoming productions. Participants also viewed "state-of-the-art" videos produced at NCSU to get perspective on production possibilities.

The coordinator has spent several weeks reviewing the literature and current print and electronic resources addressing biological control in greenhouses and organic nutrient management practices for greenhouse tomato production. He has met extensively with the Project Director to get "up-to-speed on the science" and to evaluate what and how much technical information to include in the production. He has met with Janet Miles, the graduate student researching organic nutrient management and biocontrol in NCSU tomato greenhouses. Much of the video footage will be shot in NCSU greenhouses. The coordinator and Miles have planned a calendar of greenhouse activities (production of a spring tomato crop is under way) that will be videotaped. They have also discussed management practices and research results of past production cycles completed during the Miles/Peet Southern Region IPM Project in organic, biorational, and conventional greenhouse tomato production. They have consulted on the best management practices (e.g. recipes for transplant production media, release rates for biocontrol agents, etc.) to include in the video production, as well as reviewed current organic nutrient recommendations.

The coordinator has completed initial draft narratives for both videotapes. These drafts have been forwarded to the project director for review. The project director will evaluate the drafts for accuracy of technical information, relevance, and appropriate "comprehension level." After this initial review, the drafts will be edited and forwarded to the other project coordinators for their review. After further edition, the coordinator will meet with the producer to translate the draft into a script appropriate for videotape. For example, the material will need to be apportioned to voice-over, visuals, graphics, interviews, etc. After this draft is completed, it will be sent to all participants for their review and comment.

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**SARE grant \$39,887**



## Development of a Dairy Farm Sustainability Checksheet and Distance Education Program

### Objectives

1.) Through the design, evaluation and subsequent use of a dairy farm sustainability checksheet, educators and producers will learn what to consider in assessing a dairy farm (cattle, sheep or goats) with an emphasis on whole farm planning and forage systems.

2.) Through the use of well-planned demonstrations, farm visits and workshop attendance, educators and farmers will learn the complex (biological, financial and social) interrelationships that must be considered in order to increase the sustainability of family dairy farms.

3.) Through training in the use of distance learning techniques, 50 educators and producers will learn an appropriate technology they can use on their farms and in future programs that will save time and money.

### Approach

In this integrated management systems training project, NCAT/ATTRA will collaborate with personnel within the Arkansas CES, NRCS, farmers and the University of TN Middle TN Experiment Station. The goal is to train educators and key producers through an interest-based partnership designed to share and improve skills and resources useful in monitoring sustainability and making recommendations for farms primarily involved in dairy production. This goal will be achieved through the development of an assessment tool (checksheet) allowing farmers to assess profitability, environmental conditions, and social impact of their dairy farming systems; and through training educators and producers in distance learning techniques. The dairy checksheet will be distributed to farmers and educators through the ATTRA program and other partners on the project. Training will occur for county level CES and NRCS personnel.

### Project Coordinator

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**SARE grant     \$54,621**





## Achieving Rangeland Sustainability Through Total Resource Management

### Objectives

1). Involve producers and appropriate resource managers in planning, implementing, and evaluating various phases of the object.

2). Develop training materials and program support resources including:

a. Develop a training manual, 12 fact sheets, 3 software packages, and a website as program support materials.

b. Assist in the development of an interactive Electronic Technology Transfer System to support the TRM program.

3) Develop and conduct 4 three-session workshops to train 80 County Extension Agents (CEAs) and NRCS Conservationists, and other Agency personnel over a two-year period.

4) Enlarge the thinking and change paradigms of participants from single components to "total" and/or ecosystem interactions in relation to ranch management decisions. Participants learn from both financial and biological perspectives (and from the rancher's perspective) skills including problem-solving skills; risk management decision-making skills, analytical skills, and planning skills.

5) Participants will understand and apply this planning process to set goals and define actions to be taken in specific ranch situations.

### Approach

Since August 1, 1999, 25% of the time of two Extension Specialists were redirected to provide leadership in sustainable rangeland issues and risk management on rangelands. Field demonstrations have been established and plans developed for an educational program on Range Animal Nutrition. Thus far, four Risk Management Fact Sheets have been developed and are being placed on the internet. Four more are in various stages of development.

The Rangeland Ecology and Management Unit uses a 33 member Clientele Committee composed of large and small acreage landowners and managers from across the state for input and direction on programs. This committee will serve as the Clientele Advisory Committee for the Total Ranch Management (TRM) project. Dr. Charles Hart presented a summary of the TRM project to this group on October 23. He received feedback and suggestions from the group on making the program more

effective and these are being incorporated into our plans. A 15-member TRM Steering Committee has been developed composed of nine Extension Faculty, one Natural Resource Conservation Service person, and five producers/land managers. Nine members of this Committee will form the Project's Management team. This Committee will begin work in December for a plan development meeting after the beginning of the new Year.

Approval has been received from the Texas Agricultural Extension Service to create an Extension Associate position and to advertise for candidates. A position description has been developed and distributed and several inquiries have been received. Candidates may be selected but a salary quote cannot be offered until the subcontract is complete and an account in the Fiscal Department at Texas A&M University has been set up.

We are looking forward to completing the planning of the program over the winter months and begin implementation in the spring.

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**SARE grant \$157,061**



## Building Capacity in Organic Agriculture: An Integrated Systems Approach to Training Agricultural Information Providers

### Project Coordinator

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### Objectives

1.) Improve the knowledge, attitudes and skills of agricultural information providers, primarily agents and specialists with the Cooperative Extension Service (CES), the Natural Resources Conservation Service (NRCS), and Master Gardener Association trainers from Georgia and Alabama in the integrated systems of producing, handling and marketing certified organic fresh produce, crops and ornamentals. The training seeks to improve the interest and abilities of participants to deal directly with questions from those interested in starting, converting to, and currently engaged in organic farming and gardening.

2.) Provide a comprehensive training and resource manual in producing, handling and marketing certified organic produce, ornamentals and row crops in a format that can be continually supplemented and updated. Such a manual is not currently available, but is being developed by North Carolina State University through a similar SARE PDP funded project.

3.) Establish demonstration sites in organic production in north, central and south Georgia for the immediate purposes of this training program and as learning resources of on-going value.

4.) Equip and motivate agricultural information providers and the Georgia Master Gardener Association to organize learning events and activities in organic agriculture to ensure the multiplier effect of this training program. The training manual will contain information on establishing demonstration plots and on-farm experiments. Information on current on-farm experiments in Georgia will be included, such as that funded by a SARE Producer Grant at Glover Family Farms. The Georgia Master Gardeners Association (GMGA) holds basic and advanced training programs throughout the State. In both these programs, CES agents and GMGA teachers trained in organics could teach on organics.

5.) Develop links among agricultural information providers in Georgia and Alabama, and with sources of information among growers, researchers and extensionists in the Carolinas. This program will develop the links among growers, information providers and researchers within Georgia that are vital to developing Georgia's organic

industry. By including participants from Alabama, we hope to build a network among agricultural information providers interested in organic agriculture between the two states. Given that more research and extension, as well as production of organics is found in North Carolina, links will be fostered among participants and resources in NC.

6.) Achieving these short-term objectives helps Georgia Organics, Inc. realize the following long-term objectives:

Increase the number of farmers, particularly smaller and limited resource farmers, involved in organic production, the number of acres under organic production and the dollar volume of organically grown produce and ornamentals in Georgia.

Realization of increased profits to small and medium family farms in part due to information providers who are better equipped concerning organics.

Producers and information providers who demand from universities in Georgia and Alabama more research-based information to improve organic production, handling and marketing.

Improved soil health, soil conservation and water quality as more acres in Georgia and Alabama are shifted from conventional agriculture to certified organic production.

The training will be offered as a separate series in north, central and south Georgia due to different agroecologies in the State and to facilitate agent participation. Each series comprises an intensive workshop followed by six monthly on-farm demonstrations, the Georgia Organics Annual conference, and a capstone workshop in early December 2000. Since Alabama does not have an organization similar to Georgia Organics, agricultural information providers from Alabama will be invited.

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**SARE grant \$115,000**

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## High-Value, Small-Scale Sustainable Vegetable and Fruit Production Methods

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During the last decade many farmers have gone out of business, in part due to the rising costs of land, machinery, chemicals, fertilizer and seed. Young people are finding it increasingly difficult to make the capital investments necessary to enter farming. In their producer grant funded project, the recipients set out to show that a sustainable profit may be made from as little as two acres and a few purchased organic fertilizers, using no chemicals, tractors or tillers.

The producers created an additional one-acre garden on their farm specifically for this project. They planted a series of vegetable and fruit crops over three years. The crops planted were corn, sweet potatoes, cabbage, strawberries, watermelon, cantaloupe and butternut squash. The garden was divided into four equal sections. Two of the sections were mulched with straw and the other two sections were mulched with black plastic. The purpose of the mulches was to see which was better at conserving soil moisture and also to determine if the hay added sufficient organic matter to the soil through decomposition.

The producers were able to demonstrate that lowering farming inputs through the use of mulches and hand labor increased economic sustainability. They grew the above vegetables and fruit crops on a one-acre garden, reduced to one-half acre partway into the project, during the three years of the project.

Since the planting and most of the weeding and maintenance labor was conducted with hand tools, the hay mulch side did not stop weed emergence and that half was overtaken with weeds. That part of the project had to be discontinued. But the side mulched with black plastic kept the weeds down, conserved soil moisture and resulted in healthy profits due to the low input costs of hand labor.

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**SARE grant      \$9,612**



## **Aquaculture Conversion Model Emphasizing Poultry and Hog Facilities Re-Use and Recycled On-Farm Resources**

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As vertical integration increasingly dominates the poultry and hog industries, more farmers undertake huge debt to erect single-use livestock confinement barns in order to contract for poultry or hog production. They often mortgage home and land to meet the integrator's demand for state-of-the-art facilities in order to secure a contract. Then for a number of reasons, often beyond their control, growers find themselves with empty single-use buildings.

This grower sought to develop a viable alternative use for livestock concentration facilities. Using empty hog barns, he attempted to demonstrate a strategy for indoor production of farm-raised fish. He used tanks made from common "found materials" and affordable supplies readily available to the farmer.

He constructed two fish tanks which were housed in climate controlled buildings formerly used for hog production. He made one tank from a four-foot tall section of a disassembled eighteen-foot diameter galvanized grain bin and a swimming pool liner. Fish were produced in a closed recirculating aquaculture system. The system captured fish manure by filtration and held it in a sand-bed tank.

The second commercial fish tank was also constructed from a disassembled galvanized grain bin and a swimming pool liner. It was located in the same building as the first tank. The second tank utilized a semi-closed system recirculating the water through underground piping to a pond on the farm. The producer raised tilapia in the tanks and experimented with trout during the cooler months.

The producer met his project goals and attracted the attention of aquaculture specialists in Virginia and North Carolina. However, due to permitting problems with the ponds, the project has yet to become operational.

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**SARE grant      \$6,000**





## Grazing Alternatives to Tall Fescue for Stocker Cattle

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Feeder/stocker cattle that come from the southeast sometimes have the stigma of being of low quality and having sub-optimal health. This results in lower prices being offered to the grower. Consequently, producing cost-efficient and healthy feeder cattle is a prime concern to growers.

Much research has been conducted on improving forage grasses but there have been varying degrees of adoption in upper-middle Tennessee. This is often because forage species developed as alternatives for other regions of the country usually have higher costs and/or increased management requirements over the commonly used tall fescue.

Tall fescue provides excellent production in the fall and spring but leaves much to be desired in the summer. Due to fescue's ability to grow almost anywhere, many producers take an either/or approach and grow either all fescue or plant exclusively some other forage.

When stocker cattle are grazed locally on endophyte infected tall fescue during the summer months they generally exhibit reduced daily weight gains and a less desirable appearance. These cattle take longer to get started on rations at feedlots, have more health problems than those grazed on other forage, and receive discounted prices.

The producer has noticed that even a limited introduction of crabgrass into a local grazing system as an alternative to tall fescue has provided measurable improvement in marketability, summer weight gains, feedlot performance, and profitability. Crabgrass is economical to produce, adaptable, and naturally occurring. It has the potential to work well in rotations with wheat and ryegrass eliminating the need to tie up the land year-round to produce summer grazing as some other species require.

This producer integrated forage species based on their seasonal production to provide maximum grazing. By blending forage species to suit land quality and area limitations he planned to provide maximum grazing forage for his livestock.

Purchased stocker cattle were randomly divided into two groups. Each group was to be grazed rotationally on either tall fescue (with some clover lezpedeza) or crabgrass and wheat/ryegrass until they weighed approximately 750 pounds (3 - 6 months). The grazing rotations were to be based on forage availability using temporary fencing where feasible.

Forage availability estimates were to be determined and stocking rate data collected. The plan was to harvest excess forages as hay and determine total yield. The producer planned to take forage samples on a regular basis and analyze them to determine the nutritional quality of the two forage groups.

The producer had the cattle weighed as they were sorted to a grazing system and thereafter at thirty day intervals. He collected data on average daily weight gain, field feed conversion estimates, individual performance relative to initial efficiency, total feed conversion, carcass quality and other pertinent performance data of the stocker cattle.

The droughts experienced during the project period affected data collection and so results were inconclusive. Nevertheless, crabgrass did play a positive role in the final growing stages of heavy yearlings before shipment to the stockyard.

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**SARE grant    \$9,982**



## Managed Grazing System to Increase Sustainability

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**SARE grant     \$2,630**

Intensive grazing, when properly managed, removes animals from riparian areas, reduces weed competition and provides land areas for wildlife utilization. Although many experts have endorsed this concept, acceptance has been slow in Kentucky. Producers have little experience in the techniques and management required to accomplish it successfully.

This project was dedicated to educating thirty producers on the integration of resources and the benefits of intensive grazing. The Madison County Beef Cattle Association hopes that as the producers begin to utilize parts of the program, other producers will view the results and also begin moving toward managed grazing. Producers in surrounding counties were encouraged to attend in order to broaden the scope of the project and to provide them the opportunity to develop their own programs.

The project gathered together a committee of beef producers, extension, state and local NRCS, Berea College and Eastern Kentucky University personnel. They developed a day-long hands-on seminar in integrated resource management with a focus on management intensive grazing. The seminar integrated classroom presentations with hands-on fence building, livestock water development, clipping and weighing forages and forage allocation to grazing animals.

The project will be used to implement a neighbor to neighbor outreach program which utilizes cooperating host farmers who then share their ideas and experiences with other farmers in the community. The host farmer will entertain visiting farmers one-by-one by appointment. Neighbor to neighbor outreach can be used to aggressively market rotational/intensive grazing not only to traditional grazing audiences but also to historically under served groups who will benefit from good land use.

A one-day grazing school and a field day were held with seventy producers attending. As planned, producer participation was a requirement of the school; seminars, integrated classroom presentations with hands-on fence building, livestock water development, clipping and weighing forages and forage allocation to grazing animals. The school was so successful that it was the model for

a program funded by the Kentucky Department of Agriculture and the Kentucky Forage and Grasslands Council.



## **Corn Syrup as a Replacement for Mepiquat Chloride to Reduce Vegetative Growth in Cotton**

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**SARE grant     \$2,224**

Plant growth regulators are applied to cotton to reduce the vegetative growth of the cotton and encourage greater growth of the bolls. Reducing plant vegetative growth can increase yield and decrease the occurrence of some diseases and difficulties in harvesting. The common product used is Pix (mepiquat chloride). This product is expensive, and can cause reductions in yield during extremely dry seasons.

Several organic growers have started to use high fructose corn syrup, or other sugar products, to replace Pix. These products are less toxic, and less expensive. However, little experimentation has been done to document the effectiveness of sugar syrup as a cotton plant growth regulator. If this alternative to Pix proves useful, sustainability of farms would be increased by reduction in the cost of production.

In 1996, the producer received a producer grant to fund research into alternatives to conventional chemicals in the peanut and cotton rotation, including the use of fructose as a cotton growth regulator. As a result of this producer grant, three of the participating farmers will eliminate the use of in-furrow insecticides on their peanuts this year, and approximately 10 producers not associated with the original grant will test eliminating the in-furrow insecticide. However, the results of the test of high-fructose corn syrup were mixed. The producer thought that the high-fructose corn syrup would work better if applied earlier, and with more frequent, smaller applications.

In this project the producer performed careful application of high-fructose corn syrup and designed the research to answer questions that he left unanswered in his earlier research. He coordinated the use of the high-fructose corn syrup on five farms, side by side with pix and an untreated check.

The high fructose corn syrup was successful in reducing vegetative growth. However, the results comparing it with mepiquat chloride and a control were too variable to be reliable and the high fructose corn syrup was never as successful as mepiquat chloride. Still, the results were interesting enough that the growers will try the application of high-fructose corn syrup again.





## Organic Specialty Lettuce Production in Tobacco Greenhouse

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**SARE grant      \$7,455**

Tobacco farmers in the Southeast face uncertainty over the future of the quota system and a decreasing share of the world market. International competition, higher taxes, smoking restrictions, and public attitudes will likely limit profitability, eliminate small producers and initiate changes in many rural communities.

A large majority of tobacco plants are grown in greenhouses. As a result of the decrease in the tobacco quota in 1998, there is a significant amount of unused greenhouse space. Utilizing this space could help farmers make the transition from tobacco to other high value crops.

The producer utilized existing greenhouse space and equipment, that was formerly used to grow tobacco plants, to grow specialty lettuces. Float beds, float trays, seeders and tray filling devices, used for tobacco, were used as is or with minor adaptation.

He developed a growing, harvesting and marketing system for the specialty lettuces. The system is a "cut and come again" system with two cuttings possible before reseeding. He found that it took thirty days to produce the first cutting and twenty one days for the second cutting. The producer also found that 288 cell float trays worked better than the 200 cell trays.

The specialty lettuces (e.g. bibb, greenleaf, Lollo Rosso, red oakleaf) were grown organically and harvested as baby greens for salad mixes. Competitive advantages that would allow market entry are locally grown produce, organic, freshness, good shelf life and proximity to market. Target markets for sales are specialty food stores, small chain stores, and up-scale restaurants in urban areas.

Growing several species of lettuce together did not work well because of plant competition so the producer grew them separately and made mixes after harvest. Marketing was also problematic but the grower finally sold from his existing retail outlets. Customers responded well to the locally grown, pesticide-free specialty lettuces. They liked the flavor, texture and shelf life of the lettuce. The producer sold the lettuce for \$3.50 to \$4.00 for one-half pound. He found that wholesale prices needed to be in the \$10.00 to \$13.00 range per three pound box in order to stay competitive with California lettuce.



## Alum Amended Solids Separation and Composting of Swine Waste

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Many swine farms, especially in the South, produce more nutrients in swine manure than can be effectively used on the producer's land. If excess nutrients are applied to crop land over time, nutrient levels (especially phosphorus) will build up in the soil and then run off into surrounding bodies of surface water and/or leach into ground water, eventually causing eutrophication of lakes and streams. In addition, odors are a constant threat to good relations with neighbors. Anything that can potentially reduce odors would be a positive step toward the sustainability of a swine operation.

If a significant fraction of swine waste nutrients can be removed from the farm in an efficient, economical method, a more sustainable operation of these farms would be possible. One method of removal is through marketing of compost. A solids separation process would provide feedstock for compost and simultaneously make lagoon management more efficient.

One of the problems with solids separation is that phosphorus tends to stay with the liquid fraction, and thus stay on the farm instead of being removed with the compost. In this project, the producer added alum before solids separation. Research has shown that the addition of alum tends to (1) improve the efficiency of the solids separator by causing solids to coagulate, (2) cause much of the phosphorus to remain in the solids fraction, and (3) reduce odors in the composting phase.

An additional advantage is that by removing much of the phosphorus from the liquid fraction (lagoon), the buildup of struvite in pipes and pumps would be reduced or eliminated. Struvite (magnesium ammonium phosphate hexahydrate) is a salt that builds up in equipment used for pumping waste water for recirculation, flushing buildings, or irrigation onto fields. This is an expensive problem on some farms, and the elimination of this problem would help make the total system (alum addition, solids separation, composting) more economically feasible.

The goals of the project were met. Alum (aluminum sulfate) was used to treat the swine effluent in a settling basin prior to discharge into the treatment lagoon. The alum acted as a dispersing agent to separate the solids from the effluent and also to keep the phosphorus with the solids. The

solids were composted and the effluent was applied to land.

The system was successful at removing solids from the effluent. In addition, twice the amount of phosphorus was removed with alum treatment than without it. This resulted in less land needed for effluent application.

### Cooperators

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SARE grant \$9,100

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## Multiple On-Farm Use of Aquatic Plants and Animals

PG96-38  
Continuing Project  
December 1999

Many small farmers find it difficult to earn a living wage. Moreover, the increasing costs of farming and low return on capital make it difficult for new farmers to get started. The grower has designed a project that will help overcome these barriers by utilizing existing ponds and water sources to grow aquatic plants and animals.

Farms in the south often have ponds or water sources that are seldom utilized for growing cash crops. And many different aquatic plants have economic value as food for human consumption, animal fodder, and for sale as garden ornamentals. Furthermore, aquatic and bog plants are some of the best known filters for purifying water, and they also recycle nutrients. This is increasingly important for farms that raise livestock or have problems with nutrient leaching and runoff.

This project will recycle runoff from animal pens, and domestic greywater through a series of filter beds, utilizing aquatic plants to capture nutrients and cleanse the water. The grower will develop a duck/tilapia/aquatic plant system in which the ducks and tilapia eat the aquatic plants. In turn, the ducks and tilapia will fertilize the water and the aquatic plants. He will use some aquatic plants (water hyacinths and duckweed) as alternative feed for pigs and chickens. Lastly, he plans to market other aquatic plants as vegetables (duck potato, watercress, water spinach, water chestnut) and ornamentals (water lilies, lotus, water lettuce, bulrushes).

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**SARE grant \$9,575**

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## Sustainability Starts at Home: Building Regional Self Reliance Through Agritourism

FS97-46  
Continuing Project  
December 1999

During 1996, farmers in the eastern Kentucky counties of Lee, Wolfe, Owsley, Powell, Estill and Menifee, working with Commodity Growers Cooperative, formed the Archway Regional Tourism Association (ARTA). The goals of ARTA are:

- Serve as a resource for area farmers by providing information and assistance on cooperative advertising through signs, brochures and other marketing campaigns and business-plan development;

- Ensure that the economic benefits of farming and agricultural tourism are documented and disseminated to the public;

- Create partnerships, to accomplish their goals, with local, state and federal agencies.

Commodity Growers Cooperative, through ARTA, plans to increase markets for farm products with agricultural tourism marketing in eastern Kentucky. They will work with Natural Bridge State Park in Kentucky and other regional operations to promote sustainable agriculture by educating area farmers and consumers about:

- The value of locally and organically grown food, through events and promotions in cooperation with Natural Bridge State Park whose restaurant serves one-million visitors annually;

- Building community pride in agriculture and the region's resources through events that promote the beauty and character of the region's land, trees and mountains;

- Area agritourism opportunities—including Christmas tree farms, organic produce farms, horse farms for trail rides and other low-impact tourism and agricultural ventures—through educational and promotional materials developed through the project.

ARTA plans to conduct three major activities during the life of the project. The first activity will be to assist the Natural Bridge State Park Resort to purchase and serve locally and organically grown produce in its restaurant. For the second activity, ARTA will conduct a Fall Harvest Festival each year. The third activity proposed by ARTA will be a "Christmas in the Mountains" partnership program between area lodges and Christmas tree farmers. The program will feature tree sales and weekend activities.

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**SARE grant \$9,580**



## Crop Production Systems for Nonchemical Control of Reniform Nematodes

The reniform nematode is spreading rapidly in Alabama and is becoming an important constraint to cotton production. Monoculture production of cotton is partly to blame for the spread of this pest, and the consequent cost of chemical control is becoming prohibitive for many growers. In addition to the cost, chemical control is not a sustainable solution for many cotton growers. Because of this, alternative crops, grown in rotation with cotton, may offer a solution.

The velvet bean, which was a rotational crop grown extensively in Alabama from the late 1800's until the advent of cheap fertilizer and other agriculture chemicals in the 1940s, shows tremendous economic potential for rotation with cotton. In experimental plots, velvet bean has dramatically reduced populations of bad nematodes, increased populations of good nematodes, and helped control weeds. The velvet bean crop controls weeds partly by rapid growth that smothers weeds and partly, it is believed, through allelopathic properties.

This producer will pursue alternative control of reniform nematodes in a sustainable cotton production ecosystem using various crops in rotation with cotton. He will plant cotton to be grown respectively with corn, grain sorghum, velvet bean, velvet bean-corn and velvet bean-sorghum to determine if he can reduce the incidence of reniform nematodes.

**FS97-49**  
**Continuing Project**  
**December 1999**

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**SARE grant      \$8,892**

## Effects of Conservation Tillage on Water Quality in Southern Texas

There is tremendous interest in conservation tillage systems in the Lower Rio Grande Valley in which Cameron County is located. Producers need on-site demonstrations as well as information on the costs and benefits of the systems. The usefulness of tillage alternatives in cotton and grain sorghum have not been previously examined in Cameron County nor has an economic analysis been performed on a management system that integrates reduced tillage practices with weed and insect management practices.

This producer organization plans to increase the efficiency of cotton and grain sorghum production and reduce production costs through conservation tillage practices that optimize soil moisture reserves and integrate weed and insect management practices. They will accomplish these goals by conducting the following activities throughout the project.

- 1.) They will compare the costs and benefits of conventional and pre-plant no-till systems for cotton and grain sorghum production in the subtropical climate of Cameron County.
- 2.) Throughout the project they will establish relationships between the effects of pre-plant tillage practices and crop residue management by looking at crop yield, soil moisture, weed control, time, labor costs and net returns.
- 3.) The effects of tillage systems on cotton growth and on insect and weed management throughout the crop production season will be determined.
- 4.) The effects of conservation tillage and conventional tillage on soil moisture reserves within the soil at different depths will be investigated.
- 5.) Water quality concerns will be addressed through the application of tillage, nutrient management, and crop management technologies that also will allow acceptable net returns for producers.

**FS97-50**  
**Continuing Project**  
**December 1999**

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**SARE grant      \$8,000**

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## Effect of Different Application Rates of Swine Lagoon Effluent on Corn and Wheat

In recent years there has been a great deal of concern over the application of swine lagoon effluent to fields resulting in high concentrations of phosphorus, copper and zinc in the soil. The rates at which swine waste must be applied in order to provide sufficient nitrogen to the crop results in high soil levels of phosphorus, copper and zinc which can have negative effects on soil and water quality. The excess elements have become a problem because the crop can't take up all that is applied during the year and the excess runs off into rivers and streams or stays in the soil approaching toxic levels.

The majority of swine producers in North Carolina apply swine lagoon effluent to fields of grass to be used for grazing cattle or producing hay. It is the producer's belief that the nutrients in the effluent can be better utilized to fertilize grain crops grown in rotation.

This producer plans to determine the impact of a reduction in swine lagoon effluent application rates on phosphorus, copper and zinc concentrations in the soil. He also intends to determine the effect of lowered swine lagoon effluent, and nitrogen, applications on the profitability of producing corn and wheat.

Three five-acre plots will be laid out in a field adjacent to the swine operation. One plot will receive swine lagoon effluent at current recommended rates providing sufficient nitrogen for optimal production. The second plot will receive the effluent at a rate that provides adequate phosphorus for optimal production. The third plot will receive no effluent but will receive commercial fertilizers with nitrogen and phosphorus at optimal rates. Corn, soybeans and wheat will be grown on the plots during the three years of the project. Optimal effluent application rates will be based on the recommended needs of the crop being grown during the application cycle.

**FS97-51**  
**Continuing Project**  
**December 1999**

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**SARE grant \$2,317**

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## Sustainable Pumpkin Production in the Southeast

The production of food and fiber with low off-farm inputs is one of the goals of sustainable agriculture. This producer will use a legume cover crop to supply most of the nitrogen demand of his pumpkins.

He plans to evaluate a pumpkin production system using a legume cover crop preceding pumpkins and to use cover crop residue to suppress weeds and to provide erosion control during pumpkin production. Water holding capacity should be increased as a result of the cover crop and residue.

In the fall, the producer plans to establish four test plots, each consisting of three rows of pumpkins. He will then use two varieties of clover with and without nitrogen. The following summer, before the pumpkins are seeded, biomass samples will be taken and the cover crops killed and turned under. Once the pumpkins mature they will be weighed and graded for overall quality.

**FS97-52**  
**Continuing Project**  
**December 1999**

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**SARE grant \$4,655**

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## Forest Site Preparation with Swine

The average cost for establishing a commercial timber stand in the piedmont and coastal areas of the South is \$100 per acre. An outdoor swine operation may help to lower these costs and reduce the need for fertilization and chemical removal of undesirable vegetative growth. Swine raised in a forest environment may also benefit from the cooler temperatures provided under a forest canopy. There are over 4000 swine producers in North Carolina with herds less than 100 sows (67 percent of total swine operations). This project may provide valuable information for a large percentage of North Carolina swine operations.

The producer plans to determine if pigs raised under forest will improve the soil characteristics and fertility of a forested ecosystem and if pigs raised under forest will improve the long-term economic viability of small swine operations.

Marketable mature timber will be removed prior to the introduction of pigs. Five one-acre plots will be fenced off and five different stocking rates and animal weights will be investigated. An additional acre plot will serve as a control and seedlings will be planted after conventional site preparation in the third year.

Pig numbers will be adjusted according to the results desired and the ability of the ground cover to maintain nutrients from swine waste in test plots. Loblolly pine seedlings will be planted in the test plots after three years.

**FS97-54**  
**Continuing Project**  
**December 1999**

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**SARE grant     \$5,088**

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## Overwintering Survival of Kentucky Honeybees

The important role honeybees play in agriculture is known to most fruit and vegetable growers who require bees for pollination. However, the unfavorable economics of beekeeping leads some apiarists in the northern United States and Canada to kill their hives each year instead of trying to overwinter them.

Most beekeepers in Kentucky do not insulate their hives and lose approximately 45 percent of their bees during the winter months. The goal of this project is to develop a sustainable system that allows the hives to survive through the winter.

The producer feels that small actions taken by the apiarist will reduce the current winter kill numbers and improve the overall strength of the colony going into the spring season. In the project he will look at two management practices that can easily be implemented by an apiarist. He plans to determine if insulating bee hives will increase overwintering survivability and to utilize a solar apparatus designed to vaporize menthol pellets in the winter. He will also administer the approved menthol treatment for tracheal mites in a way designed to combat hive losses due to them.

**FS97-55**  
**Continuing Project**  
**December 1999**

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**SARE grant     \$5,283**



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## Economics of Extended-season Cut Flower Production

FS97-60  
Continuing Project  
December 1999

Specialty cut flowers have proven to be a viable alternative agricultural business in the central United States and specialty cut flower production works very well with sustainable agriculture practices. Cover crops, biological pest control, erosion control and addition of organic matter to the soil result in excellent crops at reduced production costs.

In central Oklahoma, the majority of specialty cut flower operations utilize field production with a growing season from May through September. However, the strongest selling season runs from October through May which includes the major holidays. Demand for cut flowers and foliage is particularly strong in November for Thanksgiving Day sales, February for Valentine's Day sales, and April/May for Easter and Mother's Day sales. If a cut flower operation is able to extend their season and produce during fall, winter, and spring, the year-round cash flow generated would mean greater success.

The producer will extend the production season during winter months by using minimally heated cold-frames reducing the use of natural resources for production. The cost of the green houses is being carried by the producer. She will grow cool season and warm season annuals in three greenhouse environments: heated (60-65 degrees F night); minimally heated (35 degrees F night) and unheated (ambient). One outdoor treatment will also be tried.

By producing in the ground in cold-frames rather than in traditional greenhouses, she plans to use less water, no liquid fertilizers (no nitrate and phosphate runoff) and no pesticides. An extended growing season will increase sales by allowing producers to grow crops which normally cannot be grown during the regular growing season because of heat, weather or pests.

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SARE grant      \$8,100

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## Algae-based Winter Feed for Small-Scale Goat Farm

FS97-61  
Continuing Project  
December 1999

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SARE grant      \$7,907

Meat goat farming is rapidly becoming a growth industry in Georgia especially for small farmers. The difficulty in any successful meat goat operation is the ability to sustain a breeding herd throughout the (albeit short) winter in a cost effective manner. What the producer feels is needed is an alternative/supplemental source of feed that is able to at least partially sustain a pregnant or lactating animal through the winter when no browse is available. The feed source should provide good nutrition, be cheap to produce and require no chemical fertilizers or other chemical additives.

This producer will examine the suitability of farm-produced algal mats as a feed source for a goat herd throughout the winter. Algae, including the common blue green algae (cyanobacteria), are aquatic plants which have no roots, leaves, seeds, or flowers. Over half of all the photosynthesis on earth is carried out by algae and they produce oxygen as a by-product. Blue-green algae are known by several other names including "pond scum" and "slime". The algae can be encouraged to grow on a medium that is in ready abundance on any farm regardless of size. That medium is silage made from grass clippings. This combination of grass clipping silage and algae is referred to as algal mat. The most notable feature of these mats is that on a pound-for-pound basis they have higher percentages of protein, chlorophyll and Vitamin B complex than do regular agriculture plants.

The producer will construct two artificial ponds (2 meters by 20 meters each) out of wood and lined with heavy gauge plastic in an area that receives full sun. A third pond will be constructed on a farm in south Georgia to test the reproducibility of the results. Drying racks will be constructed out of wood and plastic screen.

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## Maximizing Corn Production in the Mountains of Southeast Kentucky

No-till practices for soil conservation and split application of fertilizers are no longer new techniques. Nevertheless, it is estimated that only 30 percent of corn producers in southeast Kentucky are implementing them. It is also estimated that as many as 90 percent of producers in the remote areas this project will serve do not consult cooperative extension agents about fertilization practices and information on highest yielding cultivars for the area.

This producer organization project will involve producers who do not often consult with extension about the best practices for corn production. By working directly with producers, particularly marginal ones, the project will help them produce greater yields, preserve topsoil, increase efficiency and profits and be encouraged to continue with agriculture as a means of income for the area.

In this project, the producer organization intends to improve environmental quality by encouraging the use of no-till planting to reduce soil erosion on highly erodible land. They also plan to encourage economic sustainability by improving production on limited mountain region acreage. They will do this by utilizing the cultivar of corn best suited for production and storage in the area, conduct soil tests for appropriate fertilization and liming and demonstrate techniques for split application of nitrogen.

FS97-62  
Continuing Project  
December 1999

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SARE grant    \$4,955

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## Sustainable Wheat Management Systems

Usually, either wheat-fallow-wheat or wheat-fallow-sorghum-fallow-wheat (two crops in three years) systems are used in dry land production in the Oklahoma panhandle while continuous cropping systems are used in central Oklahoma. Gage, where the project is situated, is located in Ellis county and is central to these two areas. Consequently, the producer wants to evaluate the economic impact of annual cropping compared with fallow systems.

The producer intends to determine if wheat grain yield is lower in continuous wheat monoculture than in rotation and to determine whether the tillage system (no-tillage vs minimum or clean tillage) influences grain yields in continuous monoculture and rotation. He will also evaluate the amount of nitrogen (if any) a cover crop of Austrian winter peas contributes to subsequent wheat production.

The project consists of two experimental areas—one will be no-till and the other conventional till—within which eight wheat crop rotation systems (treatments) will be replicated four times in each area. Each treatment will be planted in plots that will be 30 feet wide by 60 feet long.

FS97-63  
Continuing Project  
December 1999

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SARE grant    \$9,344

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## Evaluation of a Low-Cost, Innovative Ensiling System for Small to Medium Dairy Operations

**FS97-64**  
**Continuing Project**  
**December 1999**

An increasing number of dairies are utilizing pasture as a major source of food to sustain profitable operations. However, few geographic areas can sustain pasture for the entire year. If high quality excess forage growth in pastures could be harvested and stored efficiently and economically, it would help meet nutritional needs during periods of limited forage.

Ensiling various crops, including those used for pasture, has been a viable on-farm alternative to meet forage needs for some time. However, silage is not practical on many farms because of the expense of storage and equipment requirements, effluent losses (a waste of nutrients and an environmental hazard), and the difficulty of blending silages to meet livestock nutritional needs.

The producer intends to address the above difficulties with a vacuum ensiling system. The system will allow limited equipment and structure requirements and the ability to ensile small amounts of forage to be harvested at any one time.

The planned forages will be ryegrass, alfalfa, bermuda grass and pearl millet because they are used on the producer's farm and they represent a winter annual, a cool season perennial, a warm season perennial and a summer annual respectively. The forage will be piled on plastic and sealed by rolling the edges together around PVC pipe. The rolled plastic will be held together by a C clip made from a piece of PVC pipe the same diameter as the pipe on which the plastic was rolled. A vacuum will be pulled on the plastic wrapped forage using an old milk vacuum pump.

Through preliminary trials the producer found that the ensiling process was satisfactory, the cows consumed the silage with no problems and milk production was maintained. The producer will determine how often to pull a vacuum, silage temperature, nutrient analysis and milk production and quality.

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**SARE grant \$10,000**

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## Vermicomposting of Coffee Pulp

**FS98-65**  
**Continuing Project**  
**December 1999**

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**SARE grant \$6,800**

Puerto Rico produces approximately 2800 tons of coffee annually, which results in nearly 40,000 tons of waste pulp by-products. This creates a potential for pollution because most of the coffee processing plants are located near springs, rivers, and lakes due to the large quantities of water used in the coffee production process,

Normally, the pulp is deposited near the processing plant, to be naturally composted for one or two years depending on the size of the pile and weather conditions. During that period leaching and runoff can occur. However, properly managed, this waste material could be developed into a soil amendment and a growing medium through vermicomposting.

Vermicomposting consists of using red earthworms (*Eisenia foetida*) to decompose and to enrich different substrates under controlled conditions. In Puerto Rico, vermicomposting using chicken manure and other by-products has been tried, but there is little information on vermicomposting of coffee pulp in Puerto Rico.

This project will look at the effects of vermicomposting and composting of coffee pulp in Puerto Rico. The project coordinators will study the effects of both composting strategies on selected soils. Lastly, they will attempt to identify potential users of vermicompost.



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## Adding Value to Kentucky Produce Through Season Extension and Market Development

FS98-66  
Continuing Project  
December 1999

Family farms in Kentucky are representative of similar farms throughout the South with the addition of one issue, dependence on a secure tobacco market. Kentucky has among the largest number of small farms in the region, with tobacco produced in 119 of the 120 counties in Kentucky. Attempts at farm diversification for Kentucky family farms are often met with marketing obstacles. In the face of failure with attempts to diversify, Kentucky farmers renew their dependence on the secure tobacco income generated once a year. In order to break this cycle of dependency, farm projects centering on diversification that include marketing development are vital.

This project proposes to add value to selected vegetable and specialty horticulture crops produced on a diversified family farm in central Kentucky by extending the production seasons and marketing window of specific horticulture products. Greenhouse production of vegetables will occur in existing tobacco greenhouses, so that there will be no expenses associated with new construction. This will result in greater year-round use of existing structures.

This project seeks to:

(1) extend the production season of specific horticulture products by using greenhouse production methods; and

(2) process pepper, tomato, sweet basil and other fresh market vegetable products by drying the product, packaging with vacuum sealing methods and developing a market for such produce items.

This project to add value will create experience in the production and marketing of packaged produce items. The goal is to ultimately achieve results that can be duplicated by other family farm operations seeking to diversify.

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SARE grant \$8,670

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## Feasibility of Indoor Culture and Production of Ornamental Goldfish

FS98-67  
Continuing Project  
December 1999

Red Cap Oranda, a fancy ornamental goldfish, is imported from Japan and China because it is not grown commercially in the United States. A favorite of retailers and hobbyists, this species (*Carassius auratus*) is subject to high mortality associated with the stress of overseas transport.

If these fish can be successfully cultured domestically for commercial distribution, rural employment opportunities would increase and dependence on foreign imports would decrease. Additionally, growing the Oranda domestically should save retailers and hobbyists thousands of dollars per year in transportation costs and lost fish.

The objective of the project is to build and operate an environmentally sound, cost-effective, closed-loop re-circulating system for the rearing of Oranda that can be adapted to both small and large-scale production.

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SARE grant \$2,216

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## Late Blight Suppression in Tomatoes Using Competing Fungi on Leaf Surfaces

Late blight (*Phytophthora infestans*) is a major problem for tomato production in the Southeast. It is by far the biggest problem with the production of organic tomatoes in Western North Carolina. This area is known for its tomatoes because the warm days and the cool nights allow fruit set to proceed through the summer when other areas are too hot to reliably set fruit. With the cool nights come foggy mornings and ideal conditions for fungus growth. Late blight can defoliate a tomato plant within a week. Conventional growers minimize this problem with a weekly or more frequent spray program. An organic spray (copper sulfate) serves as a protectant and is fairly effective on late blight but it is water soluble and must be applied after each rain. Recoating all leaf surfaces after each rain is impractical, not to mention the problem of copper buildup in the soil. Without some late blight treatment, organic tomato production is possible only about one year in five in an area known for its conventional tomatoes.

An alternative to conventional fungicides (or copper sulfate for organic producers) would improve the sustainability of agriculture in the Southeast. The approach of this project is to explore the colonization of leaf surfaces with benign microbial populations that will compete with late blight when it arrives in late summer. Several compost extracts will be tested for their ability to counter the effect of late blight on tomato leaf surfaces by providing benign microbial populations that will outcompete the late-blight microorganisms. If this alternative approach proves successful, spray programs could be cut back or switched to a more environmentally benign material. In addition to reducing off-farm inputs, this approach may allow organic growers to avoid the build-up of copper in agricultural soils.

**FS98-68**  
**Continuing Project**  
**December 1998**

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**SARE grant \$5,800**

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## Integrated Goat Management System for Fiber and Meat

Many producers in the five-county area around Okfuskee County, Oklahoma, are limited-resource part-time producers with less than 200 acres. A small-scale farming system that would allow these farmers to maximize their farm income is needed. Some farmers are attempting to develop a sustainable farming system through the use of grazed goats for meat and cashmere.

Internal parasites are one of the major causes of death in grazed goats. Anthelmintics are a major cost factor in raising goats since many operators de-worm their goats on a monthly basis. This project aims to reduce the use of, and expenditure for, anthelmintics and to use rotational grazing to help lower intestinal parasites in goats.

Seasonal legumes and rotational grazing will be used to reduce off-farm expenditures for forage and high protein supplements. Rotational grazing will also reduce the parasite load and decrease the frequency of anthelmintic use. When this is coupled with timed kid production, heavier kids and the "high-value" seasonal meat markets, the overall economic efficiency of the farming operation will be improved.

In this project, the producer intends to: (1) determine ways to efficiently harvest cashmere; (2) improve net return to producers from the marketing of "value-added" cashmere; (3) reduce off-farm expenditures for forage and high protein supplements; (4) improve economic efficiency of the farm enterprise; and (5) time kid production to capture "high-value" seasonal markets.

**FS98-69**  
**Continuing Project**  
**December 1998**

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**SARE grant \$10,000**

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## Red Plastic Mulch as an Alternative to Insecticides in Production of Seedless Watermelons

FS98-70  
Continuing Project  
December 1999

The principal insect pests that reduce yields of commercial plastic-culture seedless watermelon crops in the Southern Region are cucumber beetles, squash bugs and aphids. A key factor in successful production of the new seedless watermelons is introducing pollinators to assure an adequate fruit set. The problem many seedless watermelon growers face is that honey bees used for pollination are often killed by insecticide spray applications.

It is not feasible to stop spraying for insect control during the period when watermelon vines are in bloom and the pollinators are active. Cucumber beetles feed on the flower stamens and pistils, greatly reducing fruit set; and aphid populations can build up in a short time and transmit mosaic virus disease to a crop. Furthermore, the vines bloom and set fruit over a six week period and that is too long to delay insect pest control.

The vast majority of farmers in the Southern Region who grow watermelons using plastic mulch and trickle irrigation use black plastic. This is unfortunate because the insect pest species actually seem to be attracted to the black covered rows. Several entomologists have reported that crop rows covered with red plastic have a repellent affect on certain insect pests.

In this project, field research will be conducted in the use of red plastic mulch as a repellent to insect pests and as an alternative to insecticide spray applications in commercial production of seedless watermelons. Comparative research plots will be monitored throughout the growing season and yields will be measured to determine if red plastic can be used economically to reduce or eliminate insecticide spray applications in watermelons fields.

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SARE grant      \$7,390

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## Workshop on Parasite Control Through On-Farm Fecal Studies

FS98-71  
Continuing Project  
December 1999

Among livestock farmers, the inexperienced and the experienced often share a lack of specific knowledge about the parasites of their animals. This is, in part, because they lack the means of evaluating the level of parasitism and the type of parasites that plague their animals. As a result, intervention becomes a guessing game that is often excessive and poorly timed. Because parasitism is a serious problem in the south, this lack of knowledge can lead to decreased profits due to animal losses, wasted feed, excessive chemical/veterinary interventions, lower reproductive and survival rates, lower market weights, decreased performance and overall lower quality of products. Additionally, as a result of parasite resistance to increasingly toxic anthelmintics, increased chemical use is required.

The use of on-the-farm fecal studies and knowledge of how to interrupt the life-cycle of parasites is of primary importance. Identifying and quantifying the parasites through fecal studies is a critical step. Knowledge of the life cycle of parasites, management of all resources to interrupt that life-cycle and interventions that are strategically planned for maximum benefit are a multi-pronged approach used by the grant recipients.

In this project, the grant recipients will conduct workshops to teach farmers how to conduct fecal studies which will save the cost of veterinary services to perform the same tests. Lower costs mean farmers can perform more frequent studies which will allow better control and more effective parasite intervention.

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SARE grant      \$6,545



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## Microbial Input for Organic Production of Vegetables

**FS98-72**  
**Continuing Project**  
**December 1998**

The system of organic farming depends on recycling of leguminous and non-leguminous organic matter in crop rotations to supply nutrients and increase soil organic matter. This practice also minimizes weed, insect and disease infestations on a farm while reducing soil degradation and erosion.

Inoculation of seeds, or seedlings in nurseries, with particular species or strains of beneficial microorganisms (e.g., strains of rhizobia, azotobacter, micorrhizae, etc.) to build up their populations and enhance their beneficial effects is a well-known practice. This producer is interested in finding out if inoculating the soil with selected microorganisms that are physiologically compatible with one another may prove helpful.

The producer will test two treatments of soil inoculant that contain different mixtures of microorganisms. He will incorporate them into his usual organic practices and will also have a treatment consisting of his usual practices without any inoculant additions. He will determine whether the inoculants increase his crop yield and will also compare the costs to see if they are economically sustainable.

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**SARE grant    \$9,039**

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## Developing a Dairy Hair Sheep: Assessing the Potentials

**FS98-73**  
**Continuing Project**  
**December 1998**

Dairy sheep are not commonly raised in the southeastern United States. However, there is a wide market for dairy products from sheep, especially where high quality cheeses are enjoyed. Furthermore, sheep milk has qualities that over the centuries have proven it to be excellent for cheese and yoghurt.

Because wool does not bring the prices that it once did, sheep owners are looking for other income sources. One answer is to develop a milking hair sheep. The producer raises Katahdin meat sheep which are a hair breed. They are developed from the St. Croix, a hair breed indigenous to the Caribbean. The producer noticed that some individuals in her herd seemed to be very heavy milkers with well-attached udders and good teats, comparable to modern grade dairy goats.

While it would be possible to promote this trait by selection within the breed, out-crossing is faster and carries the added benefit of hybrid vigor. The East Friesian is a high-producing dairy breed. It is known world-wide for its superior milking abilities. The producer plans to out-breed her Katahdin to the East Friesian hoping to strike a balance between the low-maintenance hair sheep and the highly inbred dairy sheep. She plans ultimately to produce an easily maintained and productive animal for low-input, part-time farmers.

Even though the producer can not produce a fully haired dairy sheep within the time allotted for this study, she plans to show it to be quite possible to breed an animal that may ultimately replace woolled milking sheep, even in commercial dairies. The data from the animals being milked in this study should give a clear idea of the potential.

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## Alfalfa Hay Production to Lower Soil Phosphorus Levels Caused by Animal Waste Application

FS98-74  
Continuing Project  
December 1999

Efforts to manage the nutrients contained in poultry waste have traditionally emphasized nitrogen (N) management in order to reduce or prevent nitrate contamination of groundwater. By basing waste applications on N alone, phosphorus (P) in the waste is applied at two to three times its recommended rate. As a result, excessively high concentrations of P are accumulating in many Georgia soils. Because of the abundance of concentrated poultry operations in Georgia, erosion and runoff from soils that have received high rates of P have the potential to threaten water resources.

Some researchers and extension agents have suggested that producers purchase and apply commercial N and harvest hay from fields with high P levels. The grass takes up the P which is removed from the site when the hay is harvested, thus lowering soil P content. While this is an environmentally sound practice, producers who have access to abundant supplies of poultry waste are reluctant to purchase N fertilizer. Alfalfa has been suggested as a solution to the problem.

Many fields with a history of animal waste application already have the high P and K levels that alfalfa requires. Fertility levels in many of these soils are so high that it should be possible to maintain high alfalfa yields for several years without inputs of K, and for many years without inputs of P.

In this project, the producer plans to grow alfalfa to help him remove excess P from soils. While other hay crops may remove slightly more P from the soil than alfalfa, few other crops offer the same degree of animal digestibility, drought tolerance and N-fixation in addition to high levels of P removal.

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**SARE grant \$9,556**

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## An Intensive Marketing Workshop for Growers and Ranchers

FS98-75  
Continuing Project  
December 1999

The demand for sustainably-produced agricultural products is growing every year. For example, organic production is growing at twenty percent a year. However, discussions with produce managers in Texas grocery chains suggest that this rate of growth is either not true in Texas or that they, themselves, are not seeing enough Texas products.

Chefs, national food companies, and consumers all say there is not enough local sustainably-produced fresh vegetables, poultry and meat readily available in Texas. For example, much of the organic produce available in Texas at major grocery chains comes from California and other west coast states.

Seasonality of Texas produce can be one reason, but even in prime seasons consumers often complain about the lack of availability of sustainably-grown products at the same time farmers complain about the difficulty of making a living.

To help increase the availability of Texas-grown products in Texas, the Texas Organic Grower's Association (TOGA), a non-profit trade association, proposes to develop and sponsor intensive one-day workshops on marketing for current and potential sustainable growers/ranchers. The workshops will provide information on a wide range of potential markets and their requirements. The long-term goal of the workshops is to increase the number of sustainable agricultural producers and to make existing farmers more knowledgeable about markets for their sustainably grown products.

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HEB Grocery  
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South Tex Organics  
Whole Foods Southwest

Texas Dept. of  
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Arrowhead Mills

**SARE grant \$7,561**

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## Development of Low-input Practices for Rose Production

**FS98-76**  
**Continuing Project**  
**December 1998**

Roses are typically grown in monocultures and are maintained through heavy use of inorganic fertilizers, pesticides, and fungicides. The producer inherited a monoculture of 400 Simplicity rose plants from her father. He had followed the conventional practice of spraying every 5-7 days for insect and disease control, tilled frequently for weed control, used soluble fertilizers, and depended on rainfall for watering the roses.

During the first season that she alone was responsible for the roses, the grower followed most of her father's practices, making what changes she could. For example, she tried using a baking soda solution for black spot, and instead of tilling she used a leaf mulch.

The producer would like to continue growing the roses since they represent a significant investment and since her father had established a solid niche for his fresh-cut roses at the Henderson County Curb Market. She will use her Producer Grant to develop a series of practices to determine if sustainable agriculture practices can effectively control pests and diseases, suppress weeds, and provide sufficient nutrients and moisture for roses.

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**SARE grant    \$2,690**

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## Test Marketing and Financial Analysis of Fresh Cut Flowers

**FS98-77**  
**Continuing Project**  
**December 1998**

Information about the economics and marketing of fresh cut flowers is not always available to small and part-time farmers who are considering establishment of fresh cut flower enterprises. When beginning growers attempt commercial production of fresh cut flowers, they often have to discover this information for themselves.

The producer plans to provide information about the economics and marketing of twelve species of fresh cut flowers through a case study of one small-scale commercial operation. He will gather and disseminate information about the following aspects of a fresh cut flower business.

- A. All costs of production including land, labor, machinery operation, storage and supplies;
- B. production yields for twelve species of fresh cut flowers;
- C. all marketing costs including packing, transportation, promotion and sales;
- D. grading standards and procedures for each of the twelve cut flower species;
- E. price sensitivity for each of the twelve species within both retail and wholesale markets;
- F. marketing procedures used to accomplish both retail and wholesale sales;
- G. actual gross income and net income earned from each of the twelve flower species.

The species to be grown and sold will include gladiolus, asters, annual statice, liatris, gypsophila, tall phlox, yarrow, Asiatic lilies, celosia, zinnias, German statice and lavender. The information on the production and marketing of these species will be made available to other farmers throughout the Southern Region.

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## Demonstration of a Low-Input Diversified Small Farm Operation

Many small and limited-resource farmers are interested in learning of successful practitioners of sustainable agriculture. Through utilization of the whole farm concept these farmers will help to prevent damage to the soil, reduce waste material and help the farmer to increase his/her profit.

In this project, the producer will organize a team of agricultural support agencies to develop a whole farm management plan (holistic management plan). They will develop a plan to examine major biological systems involved in agriculture production and farm living. Emphasis will be placed on: green manure, soil, crop rotation, interseeding, composting, minimum and no-till, manure, controlled grazing and Integrated Pest Management (IPM)

A team of extension economists will develop a profile of the producer's farm. The profile will include the following:

1. Enterprise mix;
2. Family goals and values;
3. Income sources other than farm;
4. Farm cultural practices employed;
5. Enterprise budgets and accounting;
6. Resource Inventory;
7. Short and long-term plans.

The producer will also collaborate with South Carolina State University Extension to develop an educational program for youth and adults that will be centered around farm tours during stages of crop growth and pre-harvest. Educational programs will focus on sustainability. Record keeping will be a major component of the educational program with emphasis placed on both hand written and computerized records.

**FS98-79**  
**Continuing Project**  
**December 1999**

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**SARE grant      \$9,200**

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## Establishment of a Grazing Management School for Producers

The lack of proper grazing management is a common and widespread problem on pastures and other grazing lands in the South and especially in Alabama. Cattle producers, as a group, have done a good job with cattle production and management practices but have done a poor job of grazing management. As a result, use of southern forage resources and grazing lands has not proceeded in a sustainable manner.

Lack of proper grazing management results in reduced productivity and vigor of the forage resource. Furthermore, depending on the forage species, improper grazing practices may result in loss of the stand. Grazing that is not managed will severely restrict leaf growth of the forage plants. Above-ground leaf area is directly proportional to the quantity of roots below ground; poor leaf cover means poor root development.

Rotational grazing management systems that are based on a rigid time table of grazing and rest periods without the producer having a knowledge of practical applications of plant physiology will ultimately result in overgrazing and a failure of the grazing system when growth rates change. This has been a common problem with rotational grazing systems in Alabama and other southeastern states

This producer organization proposes to train producers in the basic concepts of proper rotational grazing management through the establishment of a grazing management school. They will conduct a grazing management school where producers will receive two to three days of basic information, as well as the opportunity to see grazing principles demonstrated. Producers will also have the opportunity for a hands-on application of the information. This will be an effective opportunity to present rotational grazing as a sustainable system for managing grazing and forage resources.

**FS98-80**  
**Continuing Project**  
**December 1999**

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**SARE grant      \$9,760**

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## Soil Nutrient Balancing in Vegetable Production

**FS98-81**  
**Continuing Project**  
**December 1998**

Sufficient available calcium (Ca) is essential for a healthy soil microbiota, as well as crop vigor and disease resistance. Low soil Ca levels and unbalanced ratios of exchangeable Ca, magnesium (Mg), and potassium (K) may constrain sustainable vegetable production in Virginia and neighboring states. Some say that even in the absence of crop Ca deficiency, the low Ca:K or Ca:Mg ratios in many Virginia soils may cause a loss of soil tilth, increased compaction, poor aeration and reduced microbial and earthworm activity.

Soil acidity is often treated with dolomitic (high-Mg) limestone, which may exacerbate a low Ca:Mg ratio. Potential benefits, to vegetable crops, from correcting this imbalance have yet to be explored or demonstrated.

This producer association proposes to establish experimental plots at five farms in Virginia and eastern Tennessee to document and illustrate the effects of differing soil Ca:Mg ratios on soil health and vegetable crop nutrition, yield and quality. Two experimental soil amendment regimes, designed to maintain different Ca:Mg ratios, will be implemented in adjacent plots at each farm. Throughout the experiment, each participating grower will keep records of inputs, crops grown, and observations of soil conditions and crop vigor. Care will be taken to ensure that all plots on a given farm are planted to the same cropping sequence.

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**SARE grant \$7,325**

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## Utilization of Wood Waste and Agricultural By-products in High-value Gourmet Mushroom Production

**FS99-84**  
**New Project**  
**December 1998**

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**SARE grant \$9,507**

Land which is too steep or poor to be cropped is often left as woodlands. The potential exists to use these woodlands to produce high-value crops such as gourmet mushrooms. In fact, mushrooms play critical ecological roles in woodlands, as well as in agricultural lands, as the primary and secondary decomposers of wood and agricultural by-products such as straw, manure, seed hulls, etc. Mushrooms are very efficient at turning agricultural by-products and wood waste into profit. They are also the vegetative bodies of mycorrhizal fungi that, through their symbiotic relationships with plants, help most forest and agricultural crops take up water and some nutrients.

Many species of mushrooms command prices of three to nine dollars per pound, fresh weight, on the wholesale gourmet and medicinal markets. Gourmet mushrooms are relatively high in protein (about 20 percent on a dry-weight basis), high in fiber and low in fat (typically below 3 percent).

Methods of cultivating wood-decomposing fungi exist which convert 20 percent of the dry mass of a substrate (such as straw or sawdust/woodchip blocks) into mushrooms. In other words, 20,000 pounds of dry sawdust and 10,000 pounds of woodchips (roughly the amount generated by harvesting less than one tree per acre annually from 75 acres) when supplemented with 8000 pounds of organic oat bran and 1200 pounds of gypsum, can be converted into 7000 pounds of dried mushrooms (about 70,000 pounds fresh weight) in one year or less.

Our proposed approach is to annually harvest a sustainable volume of the lowest quality timber off our own farm (about 100 board feet per acre for a total of 7500; less than one tree per acre), and use the by-products like stumps, tops, sawdust, planer shavings and woodchips to grow nine species of gourmet and medicinal mushrooms.

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## Effects of Cover Crops on Weed and Insect Management in Blackberries

FS99- 85  
New Project  
December 1999

The problem we want to address is weed control in brambles. On my farm, brambles require a minimum of six to seven sprays throughout the year. This amounts to approximately twelve to fifteen pounds of pesticides applied annually. Because blackberries are gaining in popularity and prices for the fruit are increasing, the time is ripe to develop sustainable methods to reduce chemical in-puts and maintain or increase yields. It is important to lower input costs and increase net profits over the life of the bramble planting.

Our objective is to effectively manage both weeds and insects and reduce dependency on herbicides and insecticides. Knowledge gained through these experiments could be applied to other small fruit or vegetable crops.

We will examine a series of cover crop treatments which will include the following:

- 1.) Utilization of weeder geese and Sudan grass. Sudan grass to be planted in the row middles with a legume crop to be established in late summer,
- 2.) Crimson clover in the plant row and Sudan grass in the row middles,
- 3.) Use of subterranean clover in the plant rows.
- 4.) Conventional control with black plastic and drip irrigation along with the application of methyl bromide.

A mow and blow method will also be used to mulch around the brambles. The object will be to determine the proper mix of cover crops that will achieve the desired control. Suppression of target weed species and insects (cane borer, Japanese beetle and thrips) will be carefully monitored with the use of surveys and traps.

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SARE grant \$9,935

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## Paper Wasp Colonization for Tent Caterpillar Control in Pecan Groves

FS99-86  
New Project  
December 1999

Tent caterpillars, army worms, horn worms, and grasshoppers all contribute, to varying degrees, to leaf defoliation in pecan trees. Conventional application of insecticides will eradicate these pests but will also kill beneficial insects such as paper wasps, lady beetles, and lacewings as well as damage beneficial bird populations.

We propose colonizing large numbers of Polistes wasps, commonly known as paper wasps, as an effective control against these pests. The paper wasp's diet consists of soft-bodied insect pests, such as caterpillars and some grasshoppers. The colonization of paper wasps in agriculture is not a new idea; Chinese farmers have used this technique since ancient times.

Paper wasps can be permanently colonized. We have observed this colonization in our pecan grove during the last three years, using fifty wasp boxes spread evenly throughout the twenty-four acre grove. We propose adding 150 new wasp boxes, bringing the total number to two hundred boxes and then assess the extent of damage from tent caterpillars at various distances from the boxes as well as throughout the grove. We will also compare damage in our grove to damage in other groves in the area using chemical control.

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## The Effect of Municipal Compost on Christmas Trees

**FS99-87**  
**New Project**  
**December 1999**

This grower plans to grow Fraser Fir Christmas trees sustainably and at a competitive cost. Using locally produced municipal compost, in place of other phosphorus and nitrogen sources, would lower the cost of growing Fraser Fir Christmas trees and contribute to a more sustainable system. Compost produced by the municipality of Jonesborough, Tennessee is made by mixing sewage sludge with yard waste.

Heavy metal and pathogen counts in sludge must be below EPA ceiling concentrations before it can be used by the public. The heavy metal count is low because the small town (Pop. 3500) has little to no industry; annual tests show five out of eleven heavy metals are below detectable limits and the other six have negligible levels. The pathogen count is reduced through proper composting.

Use of this compost for sustainable Christmas tree production would have more than one benefit. Local waste materials are recycled rather than dumped in a landfill and its use lowers or eliminates the need for supplemental sources of P and N and adds beneficial microorganisms.

The experiment will involve 1700 trees planted on five-foot centers on one acre. The treatments are:

- 1.) Seedlings receiving rock phosphate, colloidal phosphate, alfalfa meal, soybean meal and poultry litter.
- 2.) One-year old trees receiving rock phosphate, colloidal phosphate, alfalfa meal, soybean meal and poultry litter.
- 3.) Two to four-year old trees receiving rock phosphate, colloidal phosphate, alfalfa meal, soybean meal and poultry litter.
- 4.) Seedlings receiving municipal compost.
- 5.) One-year old trees receiving municipal compost.
- 6.) Two to four-year old trees receiving municipal compost.

Annual observations will be made to assess budset, needle length and color, terminal and lateral diameter and length, and trunk diameter. Annual tissue samples will be collected and tested for nutrients. Lastly, the grower will keep detailed records of expenses for each treatment.

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**SARE grant \$6,985**

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## Internal Parasite Resistance Selection Method for Sheep

**FS99-88**  
**New Project**  
**December 1999**

In the Southern United States—with long warm seasons and abundant rainfall—internal parasites are the major impediment to sheep production. The warm and moist environment is favorable for the transmission of adult parasites into the host where they reproduce and do their damage. Producers have typically approached the problem of internal parasite control with frequent and repeated use of two or three classes of anthelmintics (chemical parasiticides). While the short-term result is control by suppression, in the long-term this can result in chemical-resistant parasites and animals with weakened natural immune systems.

The hair-type breeds of sheep are known to have a higher level of natural resistance to internal parasites. However, this genetic trait will vary considerably among individual animals. Our approach to the problem of managing internal parasites in sheep is to select individuals for breeding stock that have the highest level of natural parasite resistance and then proliferate this genetic trait in our breeding program.

Hair sheep are very suitable for small farm operations or grazed in a multi-species program with cattle. They will select forbs and browse not usually selected by cattle. Also, sheep and cattle do not share internal parasites which make them very compatible as 'parasite vacuums' for each other in a lead/follow grazing scheme.

The goal of this project is to develop a producer-friendly and economically viable method for selecting parasite resistance in a specific flock and then to define a program for minimum chemical input that will do no harm to the natural defenses of the selected sheep.

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**SARE grant \$4,844**

**SARE grant \$4,844**

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## Developing a Model for Successful Direct Marketing in Southern Communities

FS99-89  
New Project  
December 1999

Many sustainable small farmers in the South are increasingly dependent on local direct-marketing options to sell their agricultural goods. The problem is that many direct-marketing channels in the South are not developed enough to sustain full-time growers.

In Florida, as in other states, community-based direct-marketing opportunities have been limited to a few major successful—and many smaller, less-developed—farmers markets. Other forms of direct marketing, such as pick-your-own operations, farm stands and community supported agriculture, are limited to certain areas and crops. The development of a steady, committed clientele interested in purchasing products directly from growers is the goal of this project.

Community Green Markets of North Florida (CGM), a not-for-profit farmer organization founded by local growers in 1996, has been operating two farmers markets in Gainesville, Florida since its inception. Its purpose is to help promote and operate farmers markets and develop marketing opportunities for growers within North Florida communities. CGM growers feel there are a number of obstacles to the growth of direct marketing opportunities in their area.

CGM will address these obstacles by developing a community-based model using a multi-faceted approach incorporating community education, promotion and community development to overcome them. They will conduct activities to educate the community about nutrition and promote the value of local agriculture through events and outreach. CGM will also work with local government to promote transportation from low-income communities to farmer's markets, sell locally grown produce to schools and other government institutions, develop cooperative kitchens to prepare value-added products and work with the Chamber of Commerce to promote farm related activities.

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**SARE grant \$7,020**

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## Crop Rotation and Rotational Grazing Study

FS99- 90  
New Project  
December 1999

Conventional tillage along with chemical and synthetic inputs to soil is a contributing cause of low organic matter, low biological activity, increased compaction and erosion. I believe that a reduced or no-till approach to agriculture is a practice that can help us solve these problems and also allow us to retain precious moisture which is hard to come by in south-central Texas.

Rotational grazing has been shown to boost the protein and total digestible nutrients of all grazed forage. We use rotational grazing as well as crop rotations on our farm and ranch to rebuild the organic matter content of our soil and thereby reduce compaction, erosion and increase soil biological activity. This practice also improves aeration of our native and improved pastures which allows for the infiltration of water and nutrients.

We will plant forage type grasses as well as some drought tolerant legumes as cover crops in the spring. Fall cover crops will be rye and legumes. Most all of the planting will be no-till. On fields where cattle have been grazed, we will try to learn what type of deep tillage works in conjunction with cover crops to reduce compaction. We intend to show that we can direct-market an organic meat product with reduced inputs while improving organic matter content, biological activity, and also reduce soil compaction and erosion.

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**Cooperators**  
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IPM Concepts

Malcolm Beck  
Gardenville Org. Products

Esper Chandler  
Texas Plant and Soil Lab

Phillip Wright  
USDA/NRCS  
Seco Creek Watershed  
Project

Lynn Post  
USDA/NRCS  
Medina County

Wayne Scholz  
Texas Extension Agent

**SARE grant \$9,876**

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## Ratite Marketing Education Program

Ratite (ostrich, emu and rhea) production in the Southeast, once dominated by a speculative demand for breeders, has now become dependent on market demand for products such as skin or hide, plumage, oil and meat. Ratite growers are now implementing scientifically proven practices of bird management and husbandry. Most producers have adopted successful breeding, brooding and rearing, nutrition, health maintenance and hatchery management and incubation practices. However, they lack the knowledge and experience required to evaluate, adopt and develop successful marketing strategies for non-traditional agricultural commodities. Increasing market demand for quality products will be essential to the continued success of the ratite industry.

Carolina Emu Ranchers, a collective group of 20 ratite farms headquartered in Cleveland County, North Carolina, will draw upon the resources of NC State University, NC Cooperative Extension and the NC Department of Agriculture to educate its members on key agricultural marketing concepts, including developing new markets, locating buyers and suppliers, conducting market research, and carrying out marketing promotions. After learning these concepts, Carolina Emu Ranchers will plan and conduct hands-on promotional activities for restaurateurs and develop promotional brochures for the medical and food service communities. Details of their marketing plan and results of their efforts will be shared with other ratite producers throughout the Southeast. A comprehensive Ratite Marketing Education Program will sustain the economic viability of the ratite industry by helping growers identify and utilize existing resources through the development of a customized ratite marketing plan.

**FS9991**  
**New Project**  
**December 1999**

### Project Coordinator

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### Cooperators

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NCSU CES

Kim Decker  
Ratite Marketing Specialist  
NC Dept. of Ag and  
Consumer Services

**SARE grant \$7,250**

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## The Effect of Crop Land Applied Poultry Litter on Water Quality

In eastern Oklahoma, and Arkansas there are a large number of poultry operations. The poultry litter produced by these operations is being applied to the land. Because of the large amount of poultry litter being produced and the small area on which to apply it, the land application has resulted in high phosphorus levels in the soil. This has created water quality problems.

There are thousands of acres of crop land to the west of the poultry operations which could utilize the phosphorus in poultry litter. I will plant crops which need high amounts of phosphorus. I will transport the poultry litter to my operations in northern Oklahoma. I will apply the litter to crop land and take soil samples and keep a record of water samples to determine if water quality changes. The poultry litter is inexpensive but transportation cost to my part of Oklahoma may be on the high side. We hope to take our results to state officials and develop a cost-share program to help pay transportation costs in the future.

**FS99- 92**  
**New Project**  
**December 1999**

### Project Coordinator

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### Cooperators

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NRCS

Brent Smith  
Farmland Industries

Mike Thralls  
Oklahoma Conservation  
Commission

**SARE grant \$9,556**



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## Alternative Parasite Control Methods for Goat Producers: A Comparative Analysis

FS99- 93  
New Project  
December 1999

In the southeastern United States, livestock producers tend to be single-owner farmers with limited acreage; meat goat producers are no exception. Most meat goat producers in the south-east, especially north Florida, are farming on far fewer acres than needed. This grazing on limited acreage often results in the tremendous problem of internal parasites. Parasitic infestation can have disastrous effects on the health of a goat herd and lead to decreased productivity and lower prices at the market. Consequently, small scale goat producers are constantly faced with the increasing costs of deworming their animals with expensive drugs. And many producers use chemical dewormers that are not even approved for goats. Because of the costs and the problem of parasite resistance to many man-made drugs, an alternative and inexpensive means to control parasites in goats is needed. This project will attempt to determine if diatomaceous earth is a cost-effective and biologically effective method of controlling parasites in goats.

Diatomaceous Earth (DE) is a natural, environmentally safe substance that has been used as a feed additive to control parasites in several animal species. In this project, the producer will determine if using DE in conjunction with pasture rotation, and limiting the use of chemical dewormers, will reduce the frequency of parasite infestation. He will also determine if deworming costs will be reduced when using DE by reducing the need for expensive chemical drugs.

In this project, 24 goats will be randomly assigned to three treatment groups. Each treatment group will be comprised of eight does. The three treatments will be: DE given as a feed supplement and deworming as needed; oral dewormer given and no DE; no dewormer or DE given.

Fecal and blood samples will be analyzed by cooperators at Florida Agricultural and Mechanical University (FAMU) Research and Extension Center. They will also conduct a statistical analysis of the data.

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### Cooperators

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Ag. Research  
Florida A&M Univ.

Angela McKenzie-Jakes  
Vonda Richardson  
Florida A&M Univ. CES

SARE grant \$5,960

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## Developing an Organically Approved Soil Mix for Use in Vegetable Transplant Production

FS99- 94  
New Project  
December 1999

A constraint to the production of vegetable transplants that meet organic regulations is the lack of a locally available, organically approved commercial soil mix or a specific and reliable formulation and methodology for a mix that could be produced on-farm. Certified organic growers currently must adhere to regulations established by their certifying agency and, in the South, there are few regional certifying agencies.

Once national organic standards are adopted, all organic producers will be required to adhere to them. This could adversely affect organic producers in the Southern region because some of the regulations may not consider constraints faced by Southern producers. In Florida, as in much of the Southern region, there is no locally available, organically approved commercial soil mix. Because of this, many local certifying agencies have not prohibited the use of standard mixes with synthetic components. It is likely that once the national organic standards have been adopted, the use of such materials will be prohibited regardless of the lack of alternative organic materials. In this project, the producer will develop a soil mix that can be used by southern farmers and also be approved as organic.

The producer, working with researchers, extension personnel and a graduate student, from the University of Florida, will attempt to develop soil mixes from readily available local and regional products. She will also design an organic fertility management system for vegetable transplant production.

### Project Coordinator

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### Cooperators

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Immokalee Research Center

Robert Hochmuth  
Suwannee Research Center

Nicholas Batty  
Horticulture

All University of Florida

SARE grant \$7,660

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## Breaking the Herbicide Habit: Integrating Cover Crops with Herbicide Application

FS99-95  
New Project  
December 1999

Traditionally, the producer used shade trees, mulching and a trimmer to manage weeds. However, after hurricane Georges eliminated the tree canopy, she was forced to rely on more aggressive practices for the management of weeds. In her project, she will develop an environmentally sensitive and cost-effective herbicide program along with the use of perennial herbaceous species, to use as living mulch, on her farm.

The producer intends to replace the weeds with a "live mulch system" comprised of herbaceous perennial species (legumes and non-legumes). These plants can control erosion and also improve soil nutrient status and soil structure. Further, they can be cut back during the nutrient-uptake peaks of the food crops to lessen nutrient competition with them.

The producer will use different doses, concentrations and frequencies of the herbicide glyphosate (Roundup) in conjunction with other cultural practices. She will conduct soil analyses, a weed inventory and a fertility program based on crop plant demands. She will also develop a list of usable perennial herbaceous species adapted to the south.

### Project Coordinator

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### Cooperators

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Gustavo Martinez  
Victor Snyder  
All University of Puerto Rico

Juan J. Sainz-Rodriguez  
Harmony Farm

SARE grant \$9,960

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## Use of Low Value Hardwoods for Shiitake Mushroom Production

FS99- 96  
New Project  
December 1999

Many farms include small woodlots or wooded field edges that are not well managed. They may contain many low-value small-diameter hardwoods such as beech, ironwood, musclewood, hickory and cherry. It is often not economical to remove these low-value trees for pulp so they are often just left to grow. This results in slower growth of the more economically valuable trees. If a market could be found for the low-value trees, their removal would increase the value of the remaining timber and the total profitability of the farm woodlot. Water quality and diversity of habitat for wildlife on the farm would also be improved.

In this project, the producer will cull some of his low-value trees for use as substrate for shiitake mushroom production. Shiitake mushrooms can be grown on a small area with minimal labor requirements. There is a good market for Shiitakes, which are prized by gourmet cooks. Many of the low-value, small-diameter hardwood tree species that need to be removed to improve the growth of remaining valuable trees in a woodlot can provide logs on which to grow Shiitake mushrooms. If found suitable for Shiitake production, these less valuable (for timber) trees could be removed and used to produce a valuable product (Shiitakes). Removal of these trees would contribute to increased growth of the remaining crop trees, improving the value of the woodlot. The small trees removed for Shiitake production should be taken out by hand with little environmental degradation to the woodlot.

### Project Coordinator

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### Cooperators

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All NC CES

SARE grant \$1,929

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## Oriental Persimmons and Pawpaws: Two Sustainable Crops for the South

FS99- 97  
New Project  
December 1999

Tobacco farmers are looking for sustainable additions/alternatives to tobacco. Some current replacements are corn, wheat, soybeans or cotton. Frequently however, production of corn, wheat, soybeans and cotton requires a lot of land, pesticides and equipment to be profitable throughout the South.

In this project, Oriental persimmons and pawpaws will be tried as a sustainable addition/alternative to tobacco. They are crops that are easy to grow and adaptable to most of North Carolina and the mid and lower south. Oriental persimmons and pawpaws have low maintenance requirements and are relatively free of pests and thus require little pesticide use. Non-toxic pesticides will be used to deal with any pests should they occur. Drip irrigation will be used to reduce water use. Leguminous cover crops will be planted to reduce the use of nitrogen fertilizers. Herbicide usage will be replaced with mowing.

The producer will plant one half-acre each of one-year-old persimmon and pawpaw trees. He plans to be able to begin picking fruit in two years and have commercial quantities in three years. At that time, the producer and his cooperators will hold a field day for interested growers as well as putting out fact sheets and news releases.

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CES

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SARE grant \$6,534

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## Demonstrating the Benefits of Agroforestry Practices on Family Farms

FS99- 98  
New Project  
December 1999

Farming on highly erodible land is adversely affecting our water resources due to erosion. Farmland in this area of Puerto Rico is quickly depleted of its nutrients and becomes eroded. Sustainability of agriculture in land like this must include agroforestry practices. We will conduct workshops on compost production and demonstrate conservation practices focused on agroforestry techniques.

Farmers are reluctant to plant trees on their farms for several reasons. Desirable trees for agroforestry are common in the forest, but are not available commercially. Tree propagation techniques are unknown to most farmers and tropical shade crops that, in the past, formed part of the production system in the mountains have fallen out of favor as higher input agriculture has been adopted. Our project will address these issues.

Demonstration workshops for farmers will include cooperators from government agencies to disseminate information about the benefits of trees and the commercial possibilities for agroforestry products. Trees can be produced by farmers using the techniques learned in this project. The inclusion of agroforestry in farming operations on highly erodible land can help make agriculture sustainable in tropical mountains.

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Matias Arroyo  
Magali Orbeta  
Farmer

Andre Sanfiorenzo, Jr.  
Horticulture Student

SARE grant \$6,704



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## Alternative Pollinators

The producer's farm grows organic seeds on contract for a national seed company. During the 1998 growing season, two cosmos type flowers failed to produce more than a ten percent seed crop even though they bloomed profusely. All indications pointed to a lack of pollination. This suspicion was strengthened by the fact many local beekeepers are losing their honey bees to mites. This is, and will be, a major problem for agriculture, especially here in the burley tobacco belt where tobacco farmers are looking to fruits and vegetables (all needing pollination) as supplements to tobacco.

Many insects, birds and bats pollinate plants. If some of these species can be identified and encouraged to stay on his farm, the producer is convinced his seed production will increase.

The producer will determine if alternative pollinators can pollinate the cosmos plants mentioned above. Further, he will attempt to identify alternative pollinators native to his area of Kentucky. He will also work with an extension agent from the University of Kentucky and a researcher from Kentucky State University to determine how to attract and maintain populations of native alternative pollinators on his farm.

**FS99- 100**  
**New Project**  
**December 1999**

### Project Coordinator

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### Cooperators

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KY CES

David Gordon  
KY State University

**SARE grant \$3,475**

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## Sustainable Winter Squash Production Using Poultry Litter

As the public in the southeast is becoming more knowledgeable about the effects of agricultural chemicals on the environment and on public health, the demand for sustainably produced, chemical-free food is growing. Yet a large percentage of the sustainably grown produce sold in Georgia is imported from California, even though much of it could be grown in the southeast.

One such example is winter squash. It could be grown in the southeast using poultry litter as a non-chemical soil amendment to provide nitrogen and other needed nutrients. One drawback however, is that the use of poultry litter to meet nitrogen requirements often results in excess phosphorus being applied to the soil. The excess phosphorus can contaminate stream water.

The producer will plant a variety of winter squash using poultry litter as a soil amendment and will use a legume in rotation preceding winter squash in an attempt to control the excess phosphorus. He will then remove the legume from the site, rather than incorporating it into the soil, thereby removing the phosphorus it has taken up from the soil.

**FS99- 101**  
**New Project**  
**December 1999**

### Project Coordinator

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### Cooperators

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Steven Patrick  
Cooperative Extension Agent

**SARE grant \$4,985**

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## Cattle Lane Construction Alternatives That Enhance Intensive Grazing Systems

FS99-102  
New Project  
December 1999

It has become evident to me that a major limitation to being able to fully use a pasture system is the lack of a lane system that allows the cows convenient access to paddocks throughout the year. I, and many other producers, have been reluctant to use pasture in wetter periods because of muddy land conditions, dirty cows, and potential damage to paddocks. And these very times of wet conditions are actually times when pasture availability and quality can be very good. Unfortunately, neither the use of mechanical harvesting equipment nor access by cows has been feasible in the past. I believe that the success and sustainability of pasture-based dairying in the Southeast will be dependent upon improving the efficiency of the use of year-round forage to allow economic returns with acceptable environmental consequences.

After participating in an Irish dairy study tour in 1998, I saw that dairy farmers there gave very high priority to establishing all-weather travel lanes which allowed access to paddocks every day of the year. Also, I have learned that by moving cows to fresh paddocks every day or even after every milking can minimize paddock damage and allow more time for recovery and regrowth. However, many grazers here in the U.S. have questions about cattle lane construction and the advantages and disadvantages of different surface materials.

I will construct about 3,000 linear feet of 10-foot wide all-weather cattle travel lanes using industrial fabric filter cloth covered in separate sections with one of several different types of surface material: 1) packed and rolled crusher-run rock; 2) reconstituted asphalt; 3) chopped slabs of recycled rubber tires; 4) ground limestone and 5) other promising materials as available. If all types of surface materials work satisfactorily, then grazers can choose based on local prices and availability.

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Dennis Bauknight  
NRCS

Greg Roscoe  
Ten CATE Industrial Fabrics

Jim Green  
Steve Washburn  
NCSU

SARE grant \$9,850

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## Evaluating the Cost of Production of Row Crops Using Precision Farming Technologies

FS99-103  
New Project  
December 1999

A sustainable family farm enterprise must be able to adapt to the changing agricultural economy through adoption of the most cost-efficient uses of all resources, land, labor, machinery, fertilizers, pesticides and information. Today's innovative research promotes the uses and benefits of new high technology tools to aid in farm management. These precision farming tools allow producers to collect large amounts of data, make computer aided decisions and vary the rate of inputs on modern farms. The notion is to manage small sections of fields for optimum yield according to crop and economic models, thereby producing higher yields and/or larger profits. However, precision farming practices originated and work well on the large fields of the Midwest, but still need to be proven economically viable under southern conditions.

Research by the University of Tennessee suggests that simple 2.5 acre grid soil sampling does not accurately reflect field conditions and does not yield positive returns. Farmers in this area need firsthand information on precision farming practices and the economic consequences of adopting some or all of the practices. In addition, small farmers need to understand that some of the precision farming practices can be adopted without personally investing in a lot of hardware and software.

This project will compare site specific management practices and traditional soil sampling and fertilization practices over a three-year period. Practices that will be evaluated and demonstrated to area producers include yield monitoring, soil sampling strategies, variable rate fertilizer applications and economic performance of these practices. The goal is to determine whether these practices can help area farmers achieve increased net profits and to determine which practices yield the highest returns.

### Project Coordinator

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### Cooperators

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Timoth Prather  
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Allen Aymett  
Giles County Farmers Co-op

Rusty Walker  
NRCS

Mike Mayfield  
USDA Farm Service Agency

SARE grant \$7,816

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## Low Cost Compost Screening

FS99-105  
New Project  
December 1999

### Project Coordinator

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### Cooperators

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NC CES

SARE grant \$2,975

Municipal yard waste is an abundant natural resource in the areas of the south with hardwood trees. Composting often is accomplished at the waste facility, and they give the material away in most cases. Utilizing this resource in organic potting mixes for mulching and for increasing organic matter in the soil makes sense. Unfortunately trash, rocks and other debris pollute what would be an excellent source of organic matter.

The goal of my project is to construct a screener out of stock parts with minimal modifications. I will modify an existing three-point-hitch concrete mixer to remove the contaminants from yard waste. A farmer with a reasonably efficient screening system would be able to utilize unscreened yard waste from a nearby facility, reducing the need to go farther from the farm and transport a higher quality product long distances. My research has convinced me that the orbital action of a trommel type screener is more efficient than a vibrating screen method. A larger custom-built cylinder will increase the cost, but the increase in capacity would likely be worth it. Estimating the cost of a custom cylinder is difficult without first modifying the stock cylinder in this project.

To determine the best cylinder shape and size it will be necessary to first modify the cylinder that comes with the implement. This will be done by cutting a series of rectangular openings around the circumference and securing rabbit-wire screen over these openings. To make this as versatile a machine as possible, the ease of changing screens for various mesh sizes will be a priority. After determining the effectiveness of this idea with stock parts, the next step would be to increase the size and adjust the shape of the cylinder to increase the capacity of the screener to meet on-farm needs.



# Administrative Council

## 1999 Membership

### Jill Auburn

SARE Program Director  
USDA/CSREES  
Washington, DC

### Peggy Barlett

Emory University  
Georgia

### Roger Barlow

State Agriculture Dept.  
Mississippi

### Sam Bass

Clemson Extension  
South Carolina

### Adell Brown

Southern University  
Louisiana

### Oscar P. Butler

South Carolina State University  
South Carolina

### Steve Carmichael

EPA  
Georgia

### Claud Evans

Producer  
Oklahoma

### Phil Greeson

US Geological Services  
Georgia

### Shirley Harris

Producer  
Tennessee

### Greg Henson

Extension Service  
Kentucky

### Janie Hipp

Kerr Center  
Oklahoma

### Alex Hitt

Producer  
North Carolina

### Jackie Judice

Producer  
Louisiana

### Thomas Klindt

Ag. Experiment Station  
Tennessee

### Rose Koenig

Producer  
Florida

### Steven Muntz

Heifer Project Intl.  
Kentucky

### Marriette H. Newcomb

Producer  
Virginia

### Jerry Pennick

Federation of  
Southern Cooperatives  
Georgia

### La Rhea Pepper

Texas Organic  
Cotton Producers  
Texas

### Tony Smith

Producer  
Georgia

### Christine Taylor Waddill

University of Florida  
Florida

### Harry Wells

Pollution Prevention Office  
USEPA  
Washington, DC

## Duties

The Southern Region SARE Administrative Council is responsible to the Secretary of Agriculture through the CSREES-ES partnership. Specific responsibilities are to:

- \* Appoint a regional host institution and regional coordinator subject to the approval of the USDA;
- \* Make recommendations to the USDA concerning research and education projects that merit funding;
- \* Promote sustainable agriculture research and education programs in the Southern Region;
- \* Establish goals and criteria for the selection of projects within the Southern Region;
- \* Appoint a Technical Advisory Committee for evaluation of proposals for projects to be considered for funding
- \* Review and act upon the recommendations of the Technical Advisory Committee and coordinate its activities with the host institution;
- \* Prepare and make available an annual report concerning Southern Region activities in sustainable agriculture.

## Membership

Terms of membership are for three years, with the option to serve more than one term. The elected membership of the Administrative Council includes:

- \* Farmers/ranchers practicing sustainable agriculture, including farmers/ranchers representing Best Utilization of Biological Applications.
- \* Nonprofit organizations with demonstrable expertise in sustainable agriculture including organizations representing Best Utilization of Biological Applications.
- \* Agribusiness with demonstrable expertise in sustainable agriculture
- \* Other persons knowledgeable about sustainable agriculture and its impact on the environment and rural communities.

\* Representatives are appointed from the following:

USDA Agriculture Research Service  
USDA Cooperative State Research  
Education and Extension Service  
US Environmental Protection Agency  
Natural Resource Conservation Service  
State agency representing sustainable agriculture  
State agricultural experiment stations  
State Cooperative Extension Services  
US Geological Survey  
SARE PDP Leadership Committee

# Technical Advisory Committee for Research and Education Grants

## Duties

The primary goal of the committee is to provide guidance to the Southern Region SARE program concerning the technical merit of proposals and projects. The committee provides recommendations for funding based on technical merit through the Project Review Committee to the Administrative Council.

- \* Evaluate preproposals and full proposals submitted to the SARE program.

- \* Participate in project and program reviews.

- \* Work with the Project Review Committee and Host Institution on developing appropriate proposal and project evaluation guidelines.

## Membership

Members are appointed for one year by the Administrative Council from the following sectors:

- \* Farmers/ranchers who practice sustainable agriculture, including farmers/ranchers representing Best Utilization of Biological Applications;

- \* Nonprofit organizations with demonstrable expertise in sustainable agriculture including organizations representing Best Utilization of Biological Applications;

- \* Agribusiness with demonstrable expertise in sustainable agriculture

- \* Landgrant researchers, scientists and extension personnel

- \* Other persons knowledgeable about sustainable agriculture and its impact on the environment and rural communities.

## 1999 Membership

**Stafford Crossman**  
Ag Experiment Station  
U.S. Virgin Islands

**Ann Fanatico**  
NCAT/ATTRA  
Arkansas

**Ted Feitshans**  
Ag Economics  
North Carolina State Univ.  
North Carolina

**Andy Hankins**  
Virginia State University  
Virginia

**Ted Jaenicke**  
Ag Economics/  
Rural Sociology  
University of Tennessee  
Tennessee

**Mark Latimore**  
Ag Extension  
Ft. Valley State University  
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**Joe Lewis**  
Entomology  
USDA-ARS  
Georgia

**Luanne Lohr**  
Ag Economics  
University of Georgia  
Georgia

**Ray McKinnie**  
Animal Science  
North Carolina A&T State  
University  
North Carolina

**Victoria Mundy**  
Agronomy  
University of Kentucky  
Kentucky

**David O'Keefe**  
Agronomy  
Full Circle Solutions  
Florida

**Kome Onokpise**  
Florida A&M University  
Florida

**Freddie Payton**  
Community Development  
University of Georgia  
Georgia

**Jim Pease**  
Ag Economics  
Virginia Tech  
Virginia

**Errol Rhoden**  
Agronomy  
Tuskegee University  
Alabama

**Glenn Richardson**  
Producer  
Texas

**Cathy Sabota**  
Plant and Soil Science  
Alabama A&M  
Alabama

**Jean Steiner**  
USDA-ARS  
Georgia

**Don Voth**  
Rural Sociology  
University of Arkansas  
Arkansas

**Robert Zabawa**  
Rural Sociology  
Tuskegee University  
Alabama

**David Zimet**  
Ag Economics  
University of Florida  
Florida

## Active Research and Education Program Projects

**LS94-62** Intercropping Small Grains and Lupin for Sustainable On-Farm Utilization, Auburn University, AL, Wayne Reeves, \$240,639

**LS96-73** Soil Conservation and Pest Management Impacts of Grass Hedges, USDA-ARS, MS, Seth Dabney, \$137,352

**LS96-74** Improving Integrated Resource Management Skills of Beef Producers, Oklahoma State University, Damona Doye, \$163,642

**LS96-75** Developing Sustainable Crop Management Systems for Improving Production of Culinary Herbs, University of the Virgin Islands, Manuel Palada, \$143,529

**LS96-76** Integration of Pastured Poultry Production Into Farming Systems of Limited Resource Farmers, Heifer Project International, AR, Skip Polson, \$149,624

**LS96-77** Development of Sustainable Cropping Systems for Seedless Watermelon and Fall Lettuce in Rotation with Green Manure, North Carolina A&T State University, M.R. Reddy, \$182, 751

**LS96-78** Saving the Southern Legacy: Heirloom Plants and Local Knowledge for Profitable, Sustainable Agriculture, University of Georgia, Bob Rhoades, \$152, 817

**LS96-80** Implementation of Alternative Agriculture Strategies for Rural Community Sustainable Development Northampton County, Virginia, The Nature Conservancy, Terry Thompson, \$228, 517

**LS97-82** Sustainable Crop and Livestock Systems in the Texas High Plains, Texas Tech University, Vivian Allen, \$222,125

**LS97-83** The Hometown Creamery Revival, VA, Vicki Dunaway, \$145,474,

**LS97-84** A Regionally Centered Sustainable Agriculture System, Appalachian Sustainable Development, VA, Anthony Flaccavento, \$173,240

**LS97-85** Impacts on Agricultural System Sustainability from Structural Change in Peanut, Poultry, Swine and Tobacco Production Systems, Center for Sustainable Systems, Hal Hamilton, \$174,858

**LS97-86** Equal Access to Agricultural Programs and Opportunities, Land Loss Prevention Project, Stephon Bowens, \$151,290

**LS97-87** An Integrated Vegetable Production, Postharvest and Marketing System for Limited-Resource Farmers in South Georgia, University of Georgia, Freddie Payton, \$134,800

**LS97-88** Producers Assessment of Sustainable Land Management Practices to Project Water Quality, USDA-ARS, GA, Jean Steiner, \$228,864

**LS97-89** Integration of Freshwater Prawn Nursery and Growout System Into Diversified Farm Systems, Kentucky State University, James Tidwell, \$155,197

**LS98-90** An Integrated System of Organic Food Production and Urban Food Waste Recycling, Full Circle Solutions, Ann Barkdoll, \$142,623

**LS98-91** Development of Decision Support Systems for Improvement of Silvicultural Practices on Farm-Based Non-Industrial Private Forests, North Carolina State University, Stephen Colbert, \$26,204

**LS98-92** Development of Sustainable Cropping Systems for Canola on Limited-Resource Farms in Alabama, Alabama A&M University, Udai Bishnoi, \$124,488

**LS98-93** Accountability at Local, State and Federal Levels for Impacts of Agricultural Conservation Practice on Water Quality, USDA-ARS, GA, Dwight Fisher, \$223,322

**LS98-94** A Model for Long-Term, Large-Scale Systems Research Directed Toward Agricultural Sustainability, North Carolina State University, Paul Mueller, \$256,604

**LS98-95** Intergenerational Education for Sustainable Agriculture, College of Charleston, Keith Richards, \$176,240

**LS98-96** Integrating Farmer-Driven, Value-Added Enterprises Into Sustainable Agriculture Systems, Sustainable Food Center, Keith Richards, \$120, 590

**LS98-97** Introducing Alternative Crops into Traditional Cotton-Grain Farming to Aid Transition to Freedom-to-Farm Agriculture, Texas A&M Extension, Roland Roberts, \$114,279

**LS99-98** Organic Vegetable Production for Limited Resource Farmers, Kentucky State University, Gary Cline, \$19,100

**LS99-99** Economic and Environmental Effects of Compost Use for Sustainable Vegetable Production, Virginia Tech, Greg Evanylo, \$153,969

**LS99-100** Systems for Sustainability of Alfalfa Production on Arid, Coastal Plain Soils Using Various Harvesting Strategies, Texas AES, Vincent Haby, \$149,750

**LS99-101** Developing Effective Methods to Assess the Impact of Community Food Security Programs on Purchase of Local Farm Produce, Florida Organic Growers, \$20,000



## Active Research and Education Program Projects

**LS99-102** A Sustainable Integrated Production System for Native Pecan and Beef Cattle Producers, Oklahoma State University, Dean McCraw, \$210,188

**LS99-103** Pastured Poultry and Vegetable Production, Southern University, James McNitt, \$89,800

**LS99-104** Polyculture of Paddlefish with Catfish in the Southern Region, Kentucky State University, Steve Mims, \$140,135

**LS99-105** Enhancing Feasibility for Range Poultry Expansion, Heifer Project International, Steve Muntz, \$175,740

**LS99-106** Integrated Crop and Sylvan Systems with Swine, North Carolina A&T University, Charles Talbot, \$156,262

**LS99-107** Ecological, Sustainable and Economic Impact of Legume-based Pasture Systems for Limited-resource, Small-ruminant Farmers, University of the Virgin Islands, Elide Valencia, \$114,810

**LS99-108** System for Conserving and Adding Value to manure Sources of Nutrients in Turfgrass Sod, Texas AES, Donald Vietor, \$16,854

**AS96-25** Controlling Cheat and Annual Ryegrass in Small Grains Using Novel Crop Harvesting Technologies, Oklahoma State University, Thomas Peeper, \$208,624

## Active Producer Grant Program Projects

**PG95-27** High-Value, Small-Scale Sustainable Vegetable and Fruit Production Methods, North Carolina, Larry and Judy McPherson, \$9,612

**PG96-35** Aquaculture Conversion Model for Poultry and Hog Facilities Emphasizing Building Re-use and Recycled On-Farm Resources, North Carolina, Benny Bunting, \$6,000

**PG96-38** Multiple On-Farm Use of Aquatic Plants and Animals, North Carolina, Harvey Harman, \$9,575

**PG96-45** Grazing Alternatives to Tall Fescue for Stocker Cattle, Tennessee, Chris Pitts, \$9,982

**FS97-46** Sustainability Starts at Home-Building Regional Self Reliance through Agritourism, Kentucky, Karen Armstrong-Cummings, \$9,580

**FS97-49** Crop Production Systems for Nonchemical Control of Reniform Nematodes, Alabama, Richard Edgar, \$8,892

**FS97-50** Effects of Conservation Tillage on Water Quality in Southern Texas, Texas, Charles Eubanks, \$8,000

**FS97-51** Effect of Different Application Rates of Swine Lagoon Effluent on Corn and Wheat, North Carolina, John Hart, \$2,317

**FS97-52** Sustainable Pumpkin Production in the Southeast, Alabama, Dwight James, \$4,655

**FS97-54** Forest Site Preparation With Swine, North Carolina, Thomas Livingston, \$5,088

**FS97-55** Overwintering Survival of Kentucky Honeybees, Kentucky, Mark Lee, \$5,283

**FS97-56** Managed Grazing System to Increase Sustainability, Kentucky, Evan McCord, \$2,630

**FS97-60** Economics of Season Extension Cut Flower Production, Oklahoma, Vicki Stamback, \$8,100

**FS97-61** Algae-Based Winter Feed for Small-Scale Goat Farm Operations, Georgia, Rosemarie Szostak, \$7,907

**FS97-62** Maximizing Corn Production Through Tillage Methods, Cultivar and Fertilization in the Mountains of Southeast Kentucky, Kentucky, David Teague, \$4,955

**FS97-63** Sustainable Wheat Management Systems, Oklahoma, Curtis Torrance, \$9,344

**FS97-64** Evaluation of a Low-Cost Innovative Ensiling System for Small to Medium Dairy Operations, Alabama, David and Leianne Wright, \$10,000

**FS98-65** Vermicomposting of Coffee Pulp, Puerto Rico, Noel Avila-Velez, \$6,800

**FS98-66** Adding Value to Kentucky Produce Through Season Extension and Market Development, Kentucky, Ann Bell, \$8,670

**FS98-67** Feasibility of Indoor Culture and Production of Ornamental Goldfish, Florida, Robert Draughon, \$2,216

**FS98-68** Late Blight Suppression in Tomatoes Using Competing Fungi on Leaf Surfaces, North Carolina, Tom Elmore, \$5,800

**FS98-69** Integrated Goat Management System for Fiber and Meat, Oklahoma, Claud Evans, \$10,000

**FS98-70** Red Plastic Mulch as an Alternative to Insecticides in Production of Seedless Watermelons, South Carolina, John Frazier, \$7,390

**FS98-71** Workshop on Parasite Control Through On-Farm Fecal Studies, North Carolina, Susan Gladin, \$6,545

**FS98-72** Microbial Input for Organic Production of Vegetables, Georgia, Skip Glover, \$9,039

**FS98-73** Developing a Dairy Hair Sheep: Assessing the Potentials, Virginia, Amy Hayner, \$4,377

**FS98-74** Alfalfa Hay Production to Lower Soil Phosphorus Levels Caused by Animal Waste Application, Georgia, Keith Boozer, \$9,556

**FS98-75** An Intensive Marketing Workshop for Growers and Ranchers, Texas, Sue Johnson, \$7,561

**FS98-76** Development of Low-input Practices for Rose Production, North Carolina, Jaqueline Jones, \$2,690

**FS98-77** Test Marketing and Financial Analysis of Fresh Cut Flowers, Virginia, Emmett Lowe, \$5,416

**FS98-78** High Fructose Corn Syrup as a Replacement for Mepiquat Chloride to Reduce Vegetative Growth in Cotton, North Carolina, Hubert Morris, \$2,224

**FS98-79** Demonstration of a Low-Input Diversified Small Farm Operation, South Carolina, Theodore Nesmith, \$9,200

**FS98-80** Establishment of a Grazing Management School for Producers, Alabama, Kenneth Rogers, \$9,760

**FS98-81** Soil Nutrient Balancing in Vegetable Production, Virginia, Mark Schonbeck, \$7,325

## Active Producer Grant Program Projects

**FS98-83** Organic Speciality Lettuce Production in Tobacco Greenhouses, North Carolina, John Vollmer, \$7,455

**FS99-84** Utilization of Wood Waste and Agricultural By-products in High-value Gourmet Mushroom Production, Kentucky, Gary Anderson, \$9,507

**FS99-85** The Effects of Cover Crops on Weed and Insect Management in Blackberries, North Carolina, Sam Bellamy, \$9,935

**FS99-86** Paper Wasp Colonization for Tent Caterpillar Control in Pecan Groves, Georgia, Frank Bibbin, \$506

**FS99-87** The Effect of Municipal Compost on Christmas Trees, Tennessee, Curtis Buchanan, \$6,985

**FS99-88** Internal Parasite Resistance Selection Method for Sheep, Texas, Ray Cloudt, \$4,844

**FS99-89** Developing a Model for Successful Direct Marketing in Southern Communities, Florida, Trace Giornelli, \$7,020

**FS99-90** Crop Rotation and Rotational Grazing Study, Texas, Ken Graff, \$9,876

**FS99-91** Ratite Marketing Education Program, North Carolina, Tina Hurdt, \$7,250

**FS99-92** The Effect of Cropland-applied Poultry Litter on Water Quality, Oklahoma, Rick Jeans, \$9,556

**FS99-93** Alternative Parasite Control Methods for Goat Producers: A Comparative Analysis, Florida, Charles Johnson, \$5,960

**FS99-94** Developing an Organically Approved Soil Mix for Use in Vegetable Transplant Production, Florida, Rosalie Koenig, \$7,660

**FS99-95** Breaking the Herbicide Habit: Integrating Cover Crops with Herbicide Application, Puerto Rico, Rebecca Perez-rossello, \$9,960

**FS99-96** Use of Low-value Hardwoods for Shiitake Mushroom Production, North Carolina, Walker Rayburn, Jr. \$1,929

**FS99-97** Oriental Persimmons and PawPaws: Two Sustainable Crops for the South, North Carolina, Lesley Sanderson, \$6,534

**FS99-98** Demonstrating the Benefits of Agroforestry Practices on Family Farms, Puerto Rico, Andre Sanfiorenzo, \$6,704

**FS99-99** Alum Ammended Solids Separation and Composting of Swine Waste, Georgia, Jimmy Shealy, \$9,100

**FS99-100** Alternative Pollinators, Kentucky, Roger Smith, \$3,475

**FS99-101** Sustainable Winter Squash Production using Poultry Litter, Georgia, Johnnie Stubbs, \$4,985

**FS99-102** Cattle Lane Construction Alternatives that Enhance Intensive Grazing Systems, South Carolina, Tom Trantham, \$9,850

**FS99-103** Evaluating the Cost of Row-Crop Production using Precision Farming Technologies, Tennessee, J. Tucker, \$7,816

**FS99-105** Low Cost Compost Screening, North Carolina, Carl Weston, \$2,975



## Professional Development Program Strategic Plan

### Vision Statement

A partnership of people working in and concerned about agriculture, sustaining a responsive network of healthy farms, healthy products, healthy communities and a healthy environment.

### Mission Statement

To provide leadership, foster partnerships and facilitate the personal and professional growth of agricultural professionals who will work towards sustaining an economically viable, socially responsive and environmentally regenerative agriculture for the southern region.

### Goals

- To create and sustain a leadership committee which works productively with the management team and serves as a model of strength in diversity, systems thinking and group creativity and whose actions receive strong support from project stakeholders.
- To provide a guiding agenda, coordination and support of training assistance to state coordinators as they achieve their state's training goals.
- To communicate the mission, goals and outcomes of the PDP to all agricultural professionals in the region.
- To foster and provide sustainable agriculture training opportunities for extension agents, NRCS personnel and other agricultural professionals.
- To maintain a reporting information system and communicate annual evaluations of the PDP to program clientele, partners in training and the SARE Administrative Council.
- To foster increased networking and joint training activities between individuals and organizations involved in sustainable agriculture training.
- To promote the personal and professional development of agricultural professionals.
- To accept, respect, and promote diverse concepts and principles.

## Professional Development Program Leadership

### State Sustainable Agriculture Coordinators

State sustainable agriculture coordinators are responsible for developing state strategic plans to address the most urgent training needs for ag professionals. Each year \$10,000 is available to each state for implementing that plan. State plan activity reports are on pages 47-51.

State sustainable agriculture coordinators also provide input to the Leadership Committee on programming priorities and approaches.

#### Alabama

Geoff Zehnder  
Cathy Sabota  
William Hodge

#### Arkansas

Tom Riley, Jr.  
Lott Rolfe, III

#### Florida

Mickie Swisher  
Cassel Gardner

#### Georgia

Mark Risse  
Mark Lattimore

#### Kentucky

Paul Deaton  
Marion Simon

#### Louisiana

Dale Pollet  
Owusu Bande

#### Mississippi

Malcolm Broome  
Jesse Harness

#### North Carolina

J. Paul Mueller  
John M. O'Sullivan

#### Oklahoma

Ross O. Love  
Nelson Escobar

#### Puerto Rico

Luis R. Mejia-Maymi

#### South Carolina

Calvin Schoulties  
Fred Broughton

#### Tennessee

Ray Humbert  
Alvin Wade

#### Texas

Charles Stichler  
Nathaniel Keyes

#### Virginia

Lori Marsh  
Mitchell Patterson, Jr.

#### Virgin Islands

Louis Petersen

### Southern Region PDP Leadership Committee

Representing a cross section of professional agricultural interests, the Leadership Committee sets program direction and policy for PDP based on input from State Sustainable Agriculture Coordinators, the Administrative Council, the Management Team and other stakeholders.

#### Zona Beaty

NRCS  
Alabama

#### Deirdre Birmingham

Georgia Organics, Inc  
Georgia

#### Malcome Broome

Mississippi State University  
Mississippi

#### Fred Broughton

South Carolina State University  
South Carolina

#### Adell Brown, Jr.

(AC rep. 1890 Land Grant)  
Mississippi

#### Steve Carmichael

(AC rep, NRCS)  
Georgia

#### Archer Christian

Brackett's Farm  
Virginia

#### Mike Everett

Producer  
Texas

#### Charles Griffith

Producer  
Oklahoma

#### Greg Henson

University of Kentucky CES  
Kentucky

#### Savi Horne

Land Loss Prevention  
Project  
North Carolina

#### Jim Joyner

Morningside Farms  
Tennessee

#### Todd Landry

Producer  
Louisiana

#### Hiu Newcomb

(AC rep, producer)  
Virginia

#### Rebecca Perez-Rossello

Harmony Farm  
Puerto Rico

#### Christine Taylor Waddill

(AC rep., 1862 Land Grant)  
Florida

### Management Team

The Management Team implements program decisions and coordinates program activities.

#### Roger Crickenberger

North Carolina State University  
North Carolina CES

#### Jim Lukens

Appropriate Technology Transfer for Rural Areas  
National Center for Appropriate Technology  
Arkansas

#### John O'Sullivan

North Carolina A&T State University  
North Carolina CEP

#### Rosanne Minarovic

Extension Associate  
North Carolina State University  
North Carolina CES

## Active Professional Development Projects

**LST96-10** Sustainable Small-Scale Agricultural Development Training Project, Southern University, LA, Adell Brown, \$25,701

**LST96-11** Southern Gathering on Agricultural Problem-Solving, University of Kentucky, R.J. Hustedde, \$52,000

**LST96-12** Facilitating Farmer-to-Farmer Networks, University of Florida, Mickie Swisher, \$80,997

**ES97-15** Kentucky Cooperative Extension System Training Project, Kentucky State University, Marion Simon, \$50,000

**ES97-16** Developing Trained Professionals and Teaching Aids to Support Educational Programs Addressing Management of Stored Grain in the Southeast, University of Georgia, Steve Brown, \$38,150

**ES97-17** Overcoming Training Obstacles: A Realistic Cost-Effective Approach, South Carolina State University, Charles Artis, \$10,000

**ES96-18** The First Requirement of Agriculture Sustainability: Efficient Management of Available Resources, South Carolina State University, Charles Artis, \$60,000

**ES97-19** Nuisances in the Community: Training on the Issues and the Methods of Mediation, National Center for Ag. Law Res. and Info., Janie Simms Hipp, \$56,000

**ES97-20** State Training in Integrated Erosion Control Systems, Oklahoma State University, Gerrit Cuperus, \$70,013

**ES97-21** State Training Enhancement Project to Ensure Effective Sustainable Agriculture Training in Integrated Erosion Control Systems, Oklahoma State University, Gerrit Cuperus, \$10,000

**ES97-25** Building Capacity in Sustainable Agriculture: A Comprehensive Training Program in Organic Farming Systems, North Carolina State University, Nancy Creamer, \$97,500

**ES97-26** Community Food Security & Marketing Capacity Development in Kentucky, Commodity Growers Cooperative, Karen Armstrong-Cummings, \$79,970

**ES97-27** Training Program Targeting Integrated Cow/Calf Operation Management, Oklahoma State University, Steven Smith, \$54,340

**ES97-28** Grassroots Empowerment in Kentucky's Local Conservation Districts: Leadership Training on Sustainable Land and Water Quality Management Practices, Kentucky Division of Conservation, Stephen Coleman, \$86,280

**ES97-29** Utilizing On-Farm Case Studies for Teaching Advanced Management and Marketing to Extension, University of Tennessee, Clark Garland, \$10,000

**ES97-30** Integrated Production of Sustainable Crops for Small Farmers in North Florida, University of Florida, Gary Knox, \$8,375

**ES97-31** Development of Sustainable Checksheet, Manual and Workshops, NCAT/ATTRA, Ron Morrow, \$69,936

**ES97-33** Alternative Sustainable Agriculture Practices for Selected Crops in Puerto Rico, Puerto Rico Extension Service, Miguel Monroig-Ingles, \$10,000

**ES97-35** Integrated Strategic Plan for Sustainable Agriculture, University of Puerto Rico, Hipolito O'Farrill, \$25,740

**ES97-36** Sustainable Agriculture Training Initiative for Texas, Texas A&M, Nancy Roe, \$70,136

**ES98-37** Oklahoma Master Woodland Owners Program, Oklahoma CES, William Ross, \$23,640

**ES98-38** Motivating Teams for Enterprise Facilitation, Delta Land and Community, Jim Worstell, \$96,000

**ES98-39** Multi-Disciplinary Training on Pasture-Based Dairy Systems, North Carolina State University, Steve Washburn, \$52,578

**ES98-40** Grazing Management Training to enhance the Sustainability of Pasture-Based Beef Production Systems, North Carolina State University, Jim Green, \$31,745

**ES98-41** Training in Value Added Syrup Crops, Alcorn CES, William Patton, \$99,912

**ES98-42** Training in Agriculture Program (TAP), Operation Spring Plant, Inc., JDorothy Barker, \$17,890

**ES99-43** Multimedia Training Resources on Sustainable Greenhouse Vegetable Production, NCSU, Mary Peet, \$39,877

**ES99-44** Development of a Dairy Farm Sustainability Checksheet and Establishment of a Distance Education Program for Training CES and NRCS Personnel to Work with Dairy Farmers, NCAT, Ann Wells, \$54,621

**ES99-45** Achieving Rangeland Sustainability Through Total Resource Management, Texas Agricultural Extension Service, Wayne Hanselka, \$157,061

**ES99-46** An Integrated Systems Approach to Training Agricultural Information Providers, Georgia Organics, Inc., Skip Glover, \$115,000



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## Reports from completed projects

Final summaries are available from some projects that finished before 1999. For a free copy of any summary listed below contact Gwen Roland at (770) 412-4786

- Biological Control and its Economics in the Southern United States (LS91-31)
- Producing Vegetables in the South Using Low-input Sustainable Techniques: Collection and Analysis of a Database (LS91-32)
- Crop Budgets for the Mid-South Region (LS91-33A)
- Total Resource Budgeting of LISA Related Management Strategies (LS91-34)
- Improved Nitrogen Use-Efficiency in Cover Crop Based Production Systems (LS91-35)
- Pest Management and Orchard Management Strategies to Reduce Pesticide and Nitrogen Inputs (LS91-36)
- Low-Input Crop and Livestock Systems for the Southeastern United States (LS91-37)
- Developing and Extending Minimum Input Strategies for Weed Control in Agronomic and Horticultural Crops (LS91-38)
- Utilization of Winter Legume Cover Crops for Pest and Fertility Management in Cotton (LS94-40)
- Organic Nitrogen Sources for Sweet Potatoes: Production Potential and Economic Feasibility (LS92-45)
- Cropping Systems for Nematode Management on Agronomic and Horticultural Crops (LS92-46)
- Farm Scale Evaluation of Alternative Cotton Production Systems (LS92-47)
- Environmentally Sound Poultry Litter Management Practices for Sustainable Cropping Systems (LS92-48)
- Organic Soil Amendments of Agricultural By-Products for Vegetable Production Systems in the Mississippi Delta Region (LS92-49)
- Participatory Assessment for Strategic Planning in Sustainable Agriculture Research and Education (LS92-50)
- Warm-Season Forage Grasses as Rotations for Sustaining Profitable Peanut Production (LS93-51)
- Utilization of Dairy Manure in Low-input, Conservation Tillage Animal Feed Production Systems (LS93-52)
- Sustainable Whole Farm Grain/Silage Production Systems for the Southeast (LS93-53)
- Evaluation of a Low-Input, No-till, No-herbicide Continuous Grazing System for Dairy Cows (LS93-54)
- Cover Crop Integration into Conservation Production Systems (LS93-55)
- Disease and Insect Management Using New Crop Rotations for Sustainable Production of Row Crops in the Southeastern United States (LS94-57)
- Post-CRP Land Management and Sustainable Production Alternatives for Highly Erodible Lands in the Southern Great Plains (LS94-58)
- Animal Waste, Winter Cover Crops and Biological Antagonists for Sustained Management of Nematodes on Cotton (LS94-60, LS95-60.1)
- Integrating Sustainable Forestry into the Whole Farm Management of Minority and Limited Resource land-owners in Two Regions of Arkansas (LS94-61)
- Intercropping Small Grains and Lupin for Sustainable On-Farm Utilization (LS94-62)
- Wildlife Enhancement and Education as a Catalyst in the Widespread Implementation of Sustainable Agricultural Practices (LS95-65)



Pasture Based Swine Production Systems for Limite-Resource Farms in the Mississippi Delta (LS95-67)

Using Farm Family Case Studies to Teach Sustainable Agriculture (LS95-68)

Managing Soil Phosphorus Accumulation from Poultry Litter Application (LS95-69)

Effects of Fertililty Inputs on Soil Quality in Limited-Resource Vegetable Farms (LS95-70)

Developing Municipal/Farm Linkages for On-Farm Composting and Utilization of Yard Wastes (LS95-71)

Agronomic and Economic Benefits of Intercropping Beans with Banana (LS95-72)

Multi-Cropping Cattle and Watermelon in the Southern Plains (LS96-79)

An Integrated Technological and Marketing Strategy to Make Broiler Production More Sustainable (AS92-1)

Habitat Enhancement for Beneficial Insects in Vegetable and Fruit Farming Systems (AS92-2)

Integration of Natural Enemies for Management of the Sweet Potato Whitefly on Vegetables (AS92-3)

Using Soldier Flies as a Manure Management Tool for Volume Reduction, House Fly Control and Feedstuff Production (AS93-9)

Poultry Litter as a Soil Amendment in Southern Row Crops (AS93-10)

Waste Management System for Loafing Areas in Dairies (AS94-12)

Management of Lepidopterous Pests in Transgenic B.t. Cotton (AS95-20)

Biological Control of Silverleaf Whitefly in Floriculture (AS95-22)

Increasing Acceptance of Low-Input Landscapes for the Southeast (AS95-23)

Development of Suitable Area-Wide Weed Management Practices for Improved Land Utilization (AS93-8)

Use of Poultry Litter for Root-Knot Nematode Management on Vegetables and Field Crops (AS93-11)

Assessing the Impact of Beneficial Insect Populations on Organic Farms (AS94-13)

Forage, Biomass and Biogas Integrated Systems for Animal Waste Management (AS94-14)

Development of Efficient Treatment of Swine Lagoon Wastewater by Constructed Wetlands (AS94-16)

Biological Control Methods for Citrus Rust Mites and Spider Mites on Florida Citrus (AS95-19)

Identifying Pesticides Most Compatible with Parasites of the Citrus Leafminer (AS95-24)

Reduced Risk Cockroach Control in Confined Animal Production (AS95-21)

Management Intensive Grazing: Foundation of Sustainable Agriculture in the South (LST96-9)

Sustainable Agricultural Marketing Through Collaborative Policy Development (LST96-13)

Responding to Expressed Needs: Regional Training with Dairy Systems Manual and Software (ES97-32)

Multi-State, Value-added Team Building in the Southern Mississippi River Delta Region (ES97-34)

No-Tillage Production of Transplanted Crops in High Cover Crop Residues (PG95-20)

Pecan IPM Using Black-Eyed Peas as a Trap Crop (PG95-21)

No-Till Grain Production for Soil and Moisture Conservation (PG95-22)

Development of Potting Soil Mixes from Local Wastes (PG95-25)

Testing the Efficacy of Alternative Methods of Whitefly Control in Organic Vegetable Production (PG95-26)

Improving Tropical Soils by Using Organic Wastes (PG95-28)

Cover Crops in Integrated Vegetable Production Systems (PG95-33)

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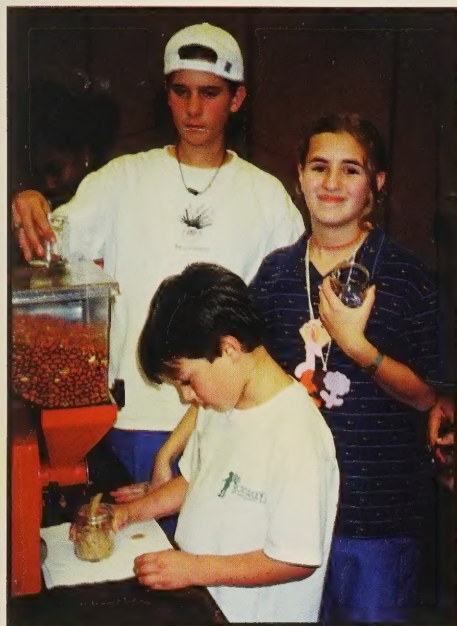
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The Mill on Wheels is helping re-vitalize the sugar cane and sorghum syrup industry in Mississippi. As part of a Professional Development project through Alcorn State University, the portable syrup mill is a teaching tool as well as a way for farmers to share the expense of adding considerable value to their crop before it leaves the farm. (Project ES98-41) Photo by Kathy Berryman.



(Left) Children making peanut butter from organic peanuts as part of an intergenerational education project headed by the College of Charleston. (Project LS98-95) Photo by Sera Vena.

(Right) John Hart of Bolton, North Carolina, is using a Producer Grant to evaluate swine effluent application rates when used as fertilizer in a corn/soybean/wheat rotation system. (Project FS97-51) Photo by John Mayne.



Mark Lee is evaluating management practices that may help his honeybees survive Kentucky winters, thus saving him the expense of starting his colonies from scratch each spring. (Project FS97-55) Photo by John Mayne.



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John O'Sullivan, (far right)  
Southern SARE Professional  
Development Program management  
team member from NCA&T State  
University Cooperative Extension,  
enjoys seeing a soil nutrient tool kit,  
which was distributed at a SARE  
PDP regional soils workshop held in  
North Carolina, being used to  
demonstrate soil characteristics to  
agriculture professionals at a tour of  
Max Carter's farm in Georgia.

The tool kit was part of a package  
shared with each state and territory  
to help extension agents and other ag  
professionals demonstrate different  
ways to test the health of soil. Photo  
by Gwen Roland.

